



REPUBLIC OF AZERBAIJAN
MINISTRY OF FINANCE
STATE TREASURY DEPARTMENT

Approved by:

TIMS Program Director,
CARANA Corporation

_____ A. Rammal

Treasury Information Management System
Based on SAP Solution

TECHNICAL REQUIREMENTS

TIMS Project - 1st Phase Deliverables

The highlighted section below represents the deliverable due from SAP CIS & Baltic States, under its Subcontract No. 729.1-SAP, Attachment E, with CARANA Corporation, dated 12 April 2004. The Subcontract corresponds to the automation of the Treasury Information Management System (TIMS) for Azerbaijan Ministry of Finance (MOF).

Deliverables	Source Documents
Approved High-Level Business Requirements Documents (SAP Solution Map) tailored to the Ministry of Finance/CARANA requirements in accordance with Subcontract Agreement #729.1-SAP.	Document: "High Level Business Requirements for Treasury Information Management System (TIMS) based on SAP Solution"
Approved Project Charter	Project Charter
Approved project procedures and standards	Project Charter: Section 8-9, Appendix 1-13
Finalized and approved end user and Project Team training plan	Project Charter: Section 9, Appendix 15
Approved technical infrastructure, landscape strategy and sizing results	Technical Requirements document
Established Project Team work environment	Project Office at MoF
Installed development system environment	R/3 Development System

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1. Introduction

The purpose of this document is to identify minimum requirements of technical infrastructure and mandatory technical procedures for the Treasury Information Management System (TIMS) deployment, development, implementation, maintenance and exploitation.

2. TIMS System Landscape requirements

This project involves the introduction and implementation of TIMS based on mySAP Business Suite and comprising of two products: SAP R/3 OLTP system and Business Intelligent Warehouse OLAP system deploying over its own system landscape.

2.1. System Definition Procedure

When designing a system landscape the number of systems required for SAP products implementation should be defined. A three-system landscape is recommended with separate systems for developments, quality assurance tests and for creating actual production environment.

Defining includes determination of every SAP system purpose, providing them with system IDs and determining a procedure for system-to-system transfers to propagate settings and developments.

All SAP systems must have a system ID also known as SID. A SID must be a combination of three alphanumeric characters. Only upper case characters can be used. The first character should only be alphabetic (non-numeric) Consideration should be given to the fact that some names are reserved and cannot be assigned to SAP system.

The system may not still exist for some time but its ID should be defined from the very beginning of the project. This ensures proper import queue maintenance for this system. This may require, for instance, creating a virtual production system prior to delivery and installation of hardware.

After all names and roles have been defined transfer procedures should be determined for all changes made in the development system.

2.2. Systems landscape TIMS

As system versions development, version testing and productive operation should be done on different data, system implementation of TIMS should be designed for three-system landscape. Settings and developments should be done in the Development System, then transported to the Quality Assurance System for the final verification and then transferred to the production system.

General characteristics of TIMS SAP R/3 and BW system landscape are represented in table 1.

Table 1. General characteristics of TIMS system landscape.

System SID	Role
MFD	SAP R/3 Development System
MFQ	SAP R/3 Quality Assurance System
MFP	SAP R/3 Production System
BWD	SAP BW Development System
BWQ	SAP BW Quality Assurance System
BWP	SAP BW Production System

2.2.1. SAP R/3 systems

This section describes roles of each system within the R/3-based transaction application system landscape and roles of these systems in change management processes.

2.2.1.1. Development System (MFD)

This system is designed for setting the functionality and developing programs as well as for pre-testing purposes. Pre-testing includes adjusting data loading programs and checking functionality changes. When all changes have been pre-tested they can be transferred to the Quality Assurance System (MFQ) for complete testing.

2.2.1.2. Quality Assurance System (MFQ)

This system is designed to complete testing and check changes for compliance with the working version. It is also designed for end-user training. After the entire configuration has been checked and test results approved changes are transferred to the Production System (MFP).

2.2.1.3. Production System (MFP)

This system is designed for production work by end users with the real company data.

Other systems within the landscape are designed to guarantee that defective programs and incorrect settings are not included in the production system.

2.2.2. SAP Business Intelligent Warehouse Systems

Roles of system landscape Business Intelligent Warehouse are analogous of SAP R/3 system landscape roles described above taking into account OLAP application specific.

2.3. Client Management Strategy

2.3.1. General

Each system of TIMS system landscape requires availability of various clients, each of them having unique data environment, which includes customizing settings, users' master records and application data (such as master data and variable records). These Client roles should be defined and spread over the system landscape prior to starting any developments or IMG-operations. In this document Client is described as number after System SID. For example, MFD(100) is described 100 (Customizing) Client of MFD System.

Each Client within a system landscape requires customization and support. Therefore, the more Clients are used in the course of implementation, the more administration operations are required to manage the system landscape.

System landscape customization requires a well-defined strategy. When establishing a target approach to creating a landscape proper consideration should be given to the following types of data:

- General customizing settings common for all Clients
- Customizing settings for a specific Client
- Repository objects
- Application data (comprising variables and master data).

Each SAP application requires some central resources used for basic functional elements. This includes a complete SAP repository and many general customizing settings used by all Clients. So even despite the fact that Clients are considered as organizationally independent data environments, those belonging to an SAP system have some central joint use resources.

Restrictions for distributing, administering and developing individual Clients within a system landscape require proper consideration to the following factors:

- Changes in customizing settings common for all Clients
- Developing and modifying repository objects
- Ensuring safety for critical data
- A reliable quality assurance system
- Ensuring accessibility and stability of the production operation environment
- Meeting performance needs.

Each Client has many attributes to be maintained to protect and prevent a Client from undesirable operations or changes.

Attributes mandatory for each Client include:

- Client role
- Changes and object transfers for a specific Client
- Changes in objects common for all Clients
- Protection — a toolkit for copying and comparing Clients
- Restrictions.

2.3.2. System Clients

All SAP R/3 systems have three standard Clients. SAP reserves Client numbers 000, 001 and 066. Roles of these Clients are described in table 2.

Table 2. Roles of SAP System Clients.

Client	Name	Description
000	SAPR	SAP Reference
001	SAPS	SAP Sample
066	SAPE	SAP Early Watch Service

After the system installation, the content of Clients 000 and 001 is identical. Both contain settings that may serve as a base for further work.

2.3.2.1. Client 000: SAP Reference (SAPR)

Client 000 is a standard Client used to store default values for all tables and organization data samples. As this Client is updated every time the system and version are updated no work can be done in it.

This Client contains company's generalized model and is used as source when creating new Clients. New Clients are used for settings, program code development, training and testing.

This Client can never be deleted from the system and no changes can be made to it unless these are system version updates. For version updates, Client-dependent changes are automatically made in Client 000. In order for these changes to be reflected by other Clients they should be transferred from Client 000.

2.3.2.2. Client 001: SAP Sample (SAPS)

Client 001 is designed to recover Client 000. It should never be modified or deleted from the system.

Client 001 as other Clients will not reflect new data after an update. If these data are required for 001 they should be transferred thereto by means of a transport system.

2.3.2.3. Client 066: SAP Early Watch Service (SAPE)

Client 066 is used to support, by SAP Company's Early Watch Service, customer's system check for proper settings. This service means checking system's performance against various criteria.

A report and recommendations regarding system settings are made as a result of this check, which are then forwarded to the customer.

Client 066 is designed to enable remote access by SAP employees. A user has been defined in this Client, under which SAP employees log in the system and get the information required. This user's password is administered by the system authorization administrator and is communicated by him to SAP immediately before an Early Watch Service session.

Client 066 should not be deleted from the system.

2.3.3. Development System Clients (MFD)

Roles of MFD System clients are described in table 3.

Table 3. Roles of MFD system clients.

Client Number	Logical Name	Role
050	SANDBOX	SandBox
100	CUST	Customizing
110	DEVL	Development
150	TESTCUST	Pre-testing

2.3.3.1. Sandbox, MFD(050)

This Client is designed for preliminary tests of developers' ideas, trials, and training.

In this client is prohibited to bring cross-client changes because of possible negative impact on Customizing and development client.

After actions in this Client have been tested, developers reproduce them manually in an integration client. Description of 050 client properties is shown in table 4.

Table 4. Properties of 050 client.

Updated	<i>No</i>
Client function	<i>Trials</i>
Changes and transfers for Client-dependent objects	<i>Changes without automatic recording</i>
Changes in objects common for all Clients	<i>Changes in objects common for Client settings are not allowed</i>

2.3.3.2. Customization, MFD(100)

This Client is designed to complete input of client dependent and client independent settings tested in the Sandbox. All changes must be included in change requests which are then transported to Quality Assurance and Production Systems. Description of 100 client properties is shown in table 5.

Table 5. Properties of 100 client.

Updated	<i>Not updated In normal operation but recovered in case of loss from a backup copy</i>
Client function	<i>Customization/Development</i>
Changes and transfers for Client-dependent objects	<i>Automatic change recording (Change requests not generated)</i>
Changes in objects common for all Clients	<i>Changes in Repository are not allowed</i>

2.3.3.3. Development, MFD(110)

This Client is designed to complete input of setting changes tested in the Sandbox and for development. All changes must be included in change requests which are then transported to Quality Assurance and Production Systems. Description of 110 client properties is shown in table 6.

Table 6. Properties of 110 client.

Updated	<i>Not updated In normal operation but recovered in case of loss from a backup copy</i>
Client function	<i>Customization/Development</i>
Changes and transfers for Client-dependent objects	<i>Changes not allowed</i>
Changes in objects common for all Clients	<i>Changes in Repository are allowed</i>

2.3.3.4. Customization and Developments Testing, MFD(150)

This Client is designed for pre-testing of customized settings and developments.

May contain some master data and transaction data required for pre-testing.

Description of 150 client properties is shown in table 7.

Table 7. Properties of 150 client.

Created	<i>By copying of Client 100</i>
Updated	<i>In normal operation, updated on developers' request from Client 100 through copying against CCCR Change request</i>
Client function	<i>Pre-testing</i>

Changes and transfers for Client-dependent objects	<i>Changes block</i>
Changes in objects common for all Clients	<i>Changes in Repository and settings common for Clients are not allowed</i>

2.3.4. Quality Assurance System Clients (MFQ)

Roles of MFQ System clients are described in table 8.

Table 8. Roles of MFQ system clients.

Client Number	Logical name	Role
200	QTST	Final Testing
210	ITST	Integration testing
250	TRNG	End-User Training

2.3.4.1. End-User Training, MFQ(250)

This Client is designed for end-user system work functionality training. Changes get to this Client after they have been tested in Final Testing and Integration Testing Clients. Description of 250 client properties is shown in table 9.

Table 9. Properties of 250 client.

Updated	<i>In normal operation, periodically updated from Client 200</i>
Client function	<i>Training</i>
Changes and transfers for Client-dependent objects	<i>Changes block</i>
Changes in objects common for all Clients	<i>Changes in Repository and settings common for Clients are not allowed</i>

2.3.4.2. Final Testing, MFQ(200)

This Client is generated through copying of settings and program code from Customization and Development Client by means of transport requests. This Client is used to test system functionalities.

Testing in this Client should ensure that all changes required are plausible, successfully transportable and not conflicting with the system's current status. Description of 200 client properties is shown in table 10.

Table 10. Properties of 200 client.

Updated:	<i>In normal operation, updated on developers' request from Client 100 through copying against CCCR Change request.</i>
Client function	<i>Testing</i>
Changes and transfers for Client-dependent objects	<i>Changes block</i>
Changes in objects common for all Clients	<i>Changes in Repository and settings common for Clients are not allowed</i>

2.3.4.3. Integration testing, MFQ(210)

This Client is generated through copying of settings and program code from Customization and Development Client by means of transport requests. This Client is used to integration test system functionalities. Description of 210 client properties is shown in table 11.

Table 11. Properties of 210 client.

Updated::	<i>In normal operation, updated on developers' request from Client 100 through copying against CCCR Change request.</i>
Client function	<i>Integration testing</i>
Changes and transfers for Client-dependent objects	<i>Changes block</i>
Changes in objects common for all Clients	<i>Changes in Repository and settings common for Clients are not allowed</i>

2.3.5. Production System Client, MFP(300)

Generally, there is one only Client in the Production System. This Client is used for system's production operation. Logical name is PROD.

After the tested configuration has been transferred to this Client, real data are loaded into it. These data are either input manually or transferred from other systems using automatic tools.

Any changes to system configuration must be pre-tested prior to transferring them to the Production Client. Only changes that have been approved after testing in Integration Testing Client can be transferred to this Client. Description of 300 client properties is shown in table 12.

Table 12. Properties of 300 client.

Updated:	<i>In normal operation, updated on developers' request from Client 100 through transport system after successful testing in Client 200 and is recovered from a backup copy in case of loss.</i>
Client function	<i>Production system</i>
Changes and transfers for Client-dependent objects	<i>Changes block</i>
Changes in objects common for all Clients	<i>Changes in Repository and settings common for Clients are not allowed</i>

2.4. Transport System TIMS Organization requirements

2.4.1. Client Copying

SAP R/3 system allows creating of new Client by copying the existing one.

Options for Client copying:

- Client copying within one system
- Copying of clients between systems
- Exporting of Client from system to Operating System level (OS)
- Importing of Client to system from OS level.

Content of all managing and setting tables from the existing Client are copied into the new one. Application data (master data and transaction data) and users master data can be transferred by setting additional parameters.

During project implementation it would be necessary to get extra clients that haven't been described yet. Creation of extra clients can be done only by approved formal request in accordance with following rules:

Initiator of extra client creation fills out formal request and transfers it to the Project Manager for approval.

Approved request is transferred to the Technical Support for execution.

2.4.2. System equalization

During stages of testing and Productive System start up it would be necessary to copy clients between systems or to copy entire systems (e.g. for testing based on productive data). System equalization procedure should be developed later on during project implementation.

2.4.3. Change Request Management

2.4.3.1. General

Change Request Management is a process of managing communications procedures between developers, adjusters and technical staff to support customization and development changes and to transfer them to other Clients or systems.

Each SAP implementation requires that changes be made to standard SAP software for better compliance with company needs. Change request management, i.e. managing changes in customization and developments, must be documented, tested, checked and then transferred to the Production system. Assigning responsible persons is recommended for all critical areas in change request management:

- Change request creation

- Change request release
- Import to quality assurance environment
- Check and accept quality assurance control
- Import to other Clients or systems.

2.4.3.2. General principals of request management

- Any changes must be distributed as change requests.
- Any changes come from MFD system (from CUST client or DEVL client).
- Incorrect changes in MFD system are never rolled away and deleted in MFQ and MFP systems. Instead of it correction is processed in MFD system then corrected version of objects transports to other systems over incorrect versions.
- CR is created and closed in same client.
- CR and/or task of CR must not be deleted except technical necessity.

2.4.3.3. Areas of Responsibility for Tasks and Change Requests

Areas of responsibility for tasks and change requests management is important aspects of transport system management.

Areas of responsibility should be distributed for all critical areas in change request management.

Distribution of areas of responsibility is realized using authorization technology SAP system.

Distribution of areas of responsibility should be realized according following procedure:

- General role of transport management are distinguished;
- Role assignment to project employees is realized according their functions.

In view of importance of this aspect, detailed procedure of areas of responsibility distribution should be issued as a separate document according item “

Transport System Use Rules”.

2.4.3.4. Principles of import to Quality Assurance System Procedure

Imports can be done on request from a project team or against a fixed schedule by employee of technical support group only.

- Full imports to target systems are recommended to be done at regular intervals (e.g. daily, weekly or monthly). Shorter intervals are not advisable.
- After import has been done to target system, sufficient time should be provided for testing.

2.4.3.5. Principles of Quality Assurance Code Recording and Testing Procedures

The following standards are established to ensure both stable development and stable quality assurance testing environment.

- After releasing a change request in the development environment, further development of this object must be stopped. This means that the current version of this object should be recorded.
- After import has been done to the Quality Assurance System, transfer (import and export) logs should be reviewed.
- Testing of objects in the Quality Assurance System should end in either acceptance or forwarding for additional development. If errors have to be corrected this should be done on the object's fixed version within the development environment.
- Repeating steps 1, 2 and 3 helps eliminate errors.
- After the testing and check have been successfully completed, the person responsible can initiate further development based on the recorded object.
- Production System import queue contains initial request and all related corrections which have been successfully imported to the Quality Assurance System.

2.4.3.6. Principles of production Environment Import Procedure

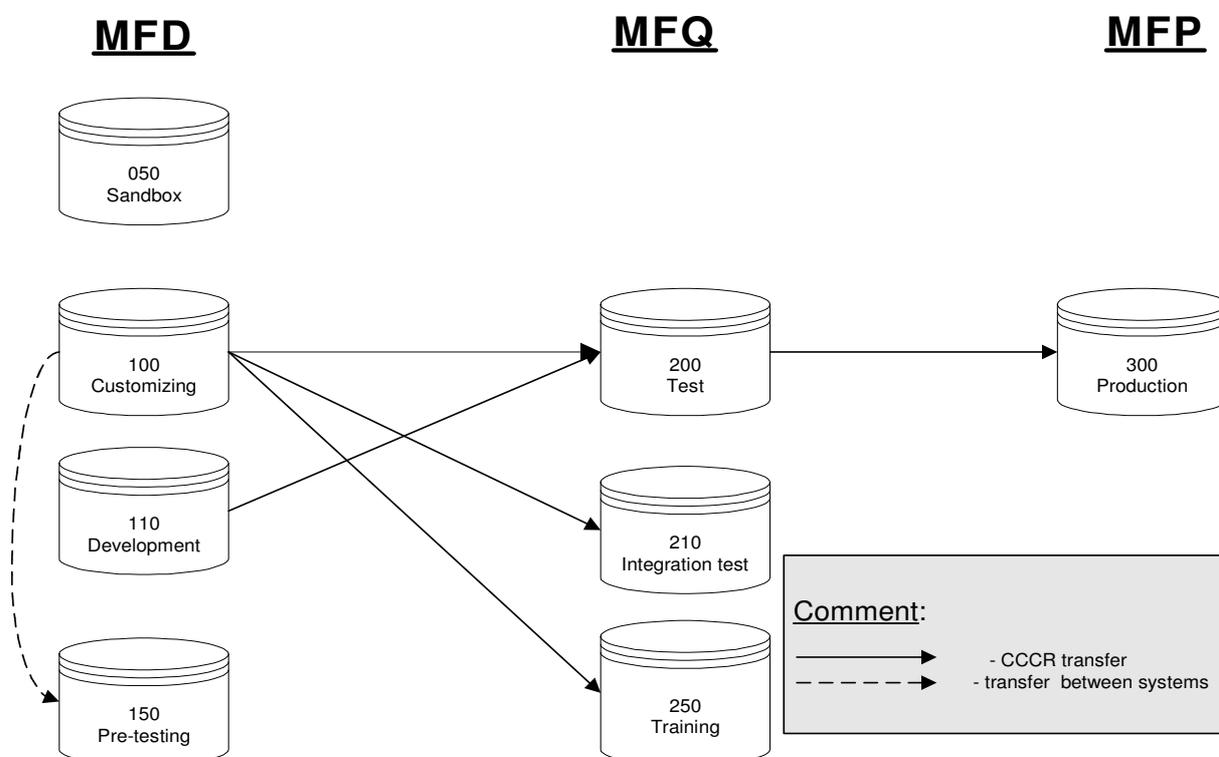
Imports to production environment are done after accepting all objects in the Production System import queue. To ensure proper order of requests import it should be done by queue.

When importing new or improved functions, even tested and checked objects can negatively affect the Production System execution environment. It is therefore better to schedule imports to Production System for periods when business data processing (including background processing) is stopped or is on an acceptably low level. Ideally, imports to Production System should be done after background processes and reservation are over prior to starting business operations.

2.4.3.7. Change Request Transfer via Transport System Diagram

Change request transfer should be accepted according picture 1.

Picture 1. Change request transfer diagram.



2.4.4. Transport System Use Rules

In view of importance of the transport system in maintaining SAP systems integrity the transport system use rules should be issued as a separate document which, besides items described in this section *Transport System Organization*, must contain:

- Organization structure of assigning employees in charge of transport system operations.
- Users' roles and authorizations regarding transport system.
- Transport request-naming agreement.
- Description of transport request life.
- Transport request life Data Flow Diagram (DFD).
- Transfer status alert procedure.
- Procedure for recording imported requests and a sample of logbook.

- Transport request transfer application templates in e-mail program format (for MS Outlook *.fdm and *.oft files).
This document will be performed on next Project stages.

3. TIMS Network Environment requirements

3.1. General

SAP applications, based on client-server architecture, need an appropriate network infrastructure to provide communication for network PCs.

The TCP/IP protocol is used as a network transport mechanism.

Network infrastructure quality substantially determines consistency and performance of SAP applications in distributed network environment.

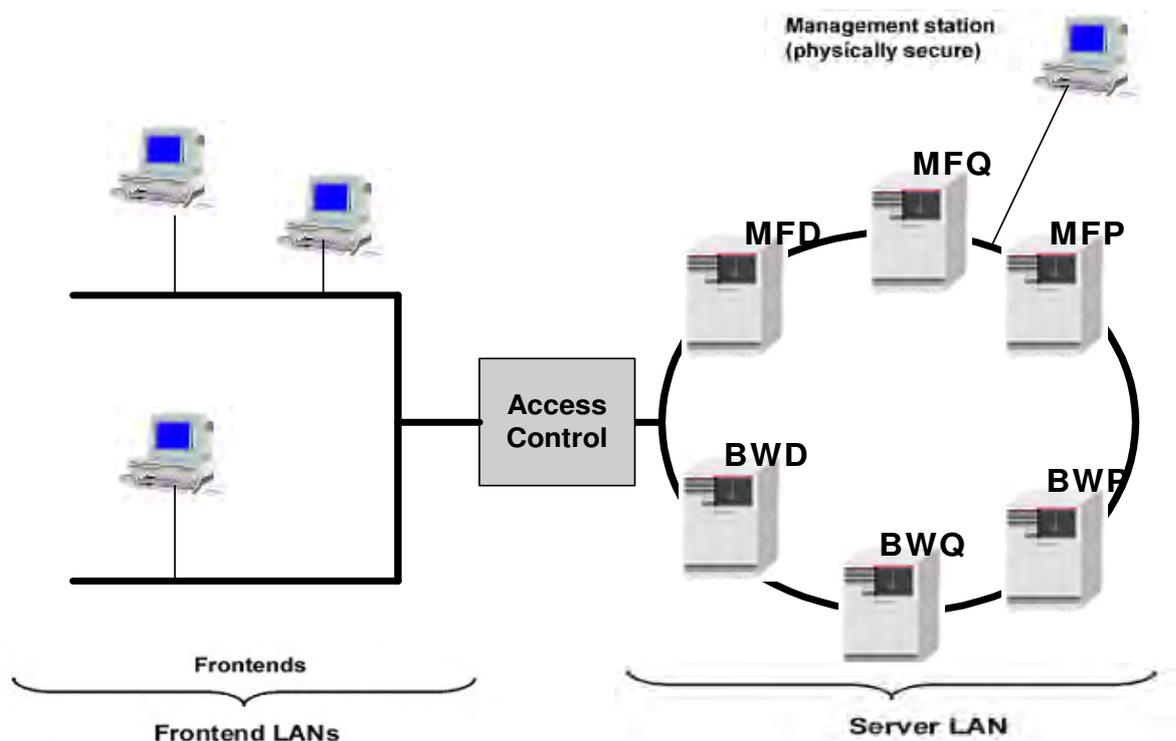
Improper network configuration can possibly cause some problems with network functions (system monitoring, RFC connections, SAPLOGON).

3.2. TIMS Network Architecture

On the following picture 2 the recommended network architecture for applications is presented:

- server hardware has been separated to the different network (Server LAN),
- end-user workstation are placed to the common access network (Frontend LAN),
- end-user access through Access Control that provide secure.

Picture 2. Recommended network architecture.



3.3. LAN

SAP recommendations about Local Area Network building for SAP application running are posted in this chapter.

3.3.1. Server LAN

Server network connects database and application servers of all project systems.

As the rule, the application and database servers network and network between different systems are utilized far more extensively than network of application servers and workstations.

In order to increase performance, enhance security and provide more flexible administration SAP recommends to:

- Use separated LAN segment for server network
- Use high-performance network with redundancy functions (Fiber Distributed Data Interface - FDDI)
- Use high-quality structured cabling system
- Use active hardware with easy administration and monitoring capabilities
- Use single server LAN
- Use reserve dual homing server connection, thus in case of one network hardware set crash traffic could flow via reserve set
- Use server with two NICs.

3.3.2. Public LAN

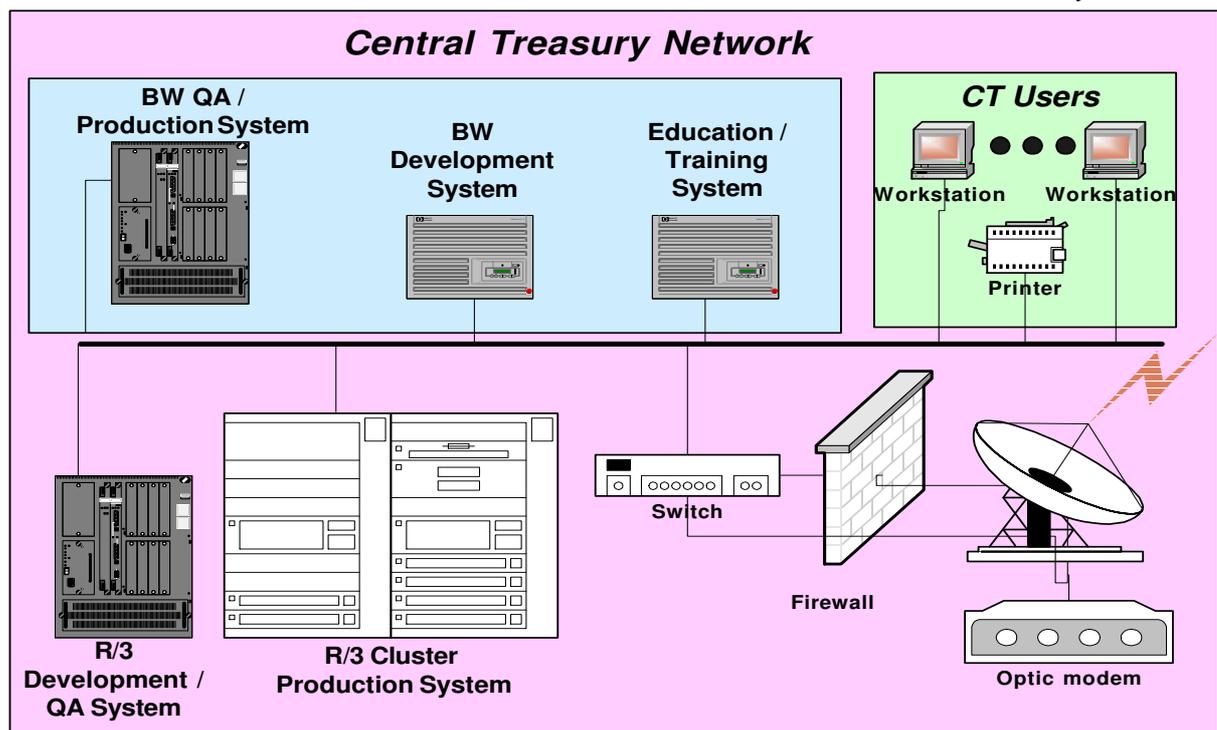
Public LAN connects application servers and user workstations. Corporate intranet is commonly used for this purpose. This network must provide the reliable interconnection between user workstations and application servers running dialog processes.

As a rule LAN provides duplex redundancy of access to servers and their functions (application servers are replaceable).

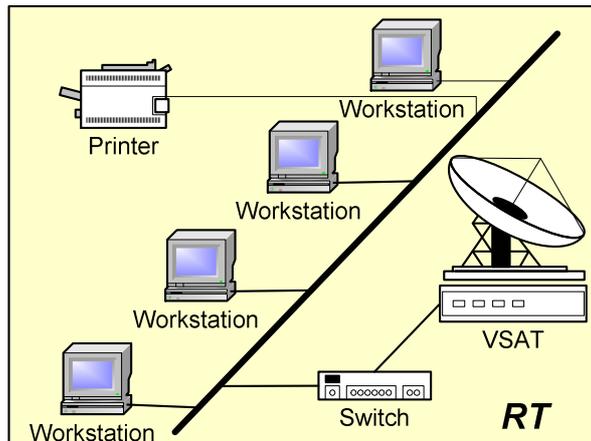
3.3.3. Network Architecture of Treasury head office, Proposed by Customer

On the following picture 3 and 4 the network architecture of treasury head office and branch offices are represented.

Picture 3. Central Treasury office.



Picture 4. Treasury branch offices



In accordance with proposed network infrastructure organization schema in the Treasury Head office there will be local public network with domain controller.

For regional branches there is possible to use LAN with domain controller as well as without it by workstation association to peer-to-peer network with IP-address range for each branch.

3.4. WAN

The present project provides for remote users. Some of them must have direct access to the application server; others will interact via the public network. The diagram in item 3.2 illustrates both cases.

For productive operation the remote users need steady access to the central system server — either directly or via SAProuter of their LAN. This can be implemented by reduplication of the data links or by creation of several independent access points.

There are SAP recommendations regarding WAN building for SAP application running.

3.4.1. Creation of Several Independent Access Points

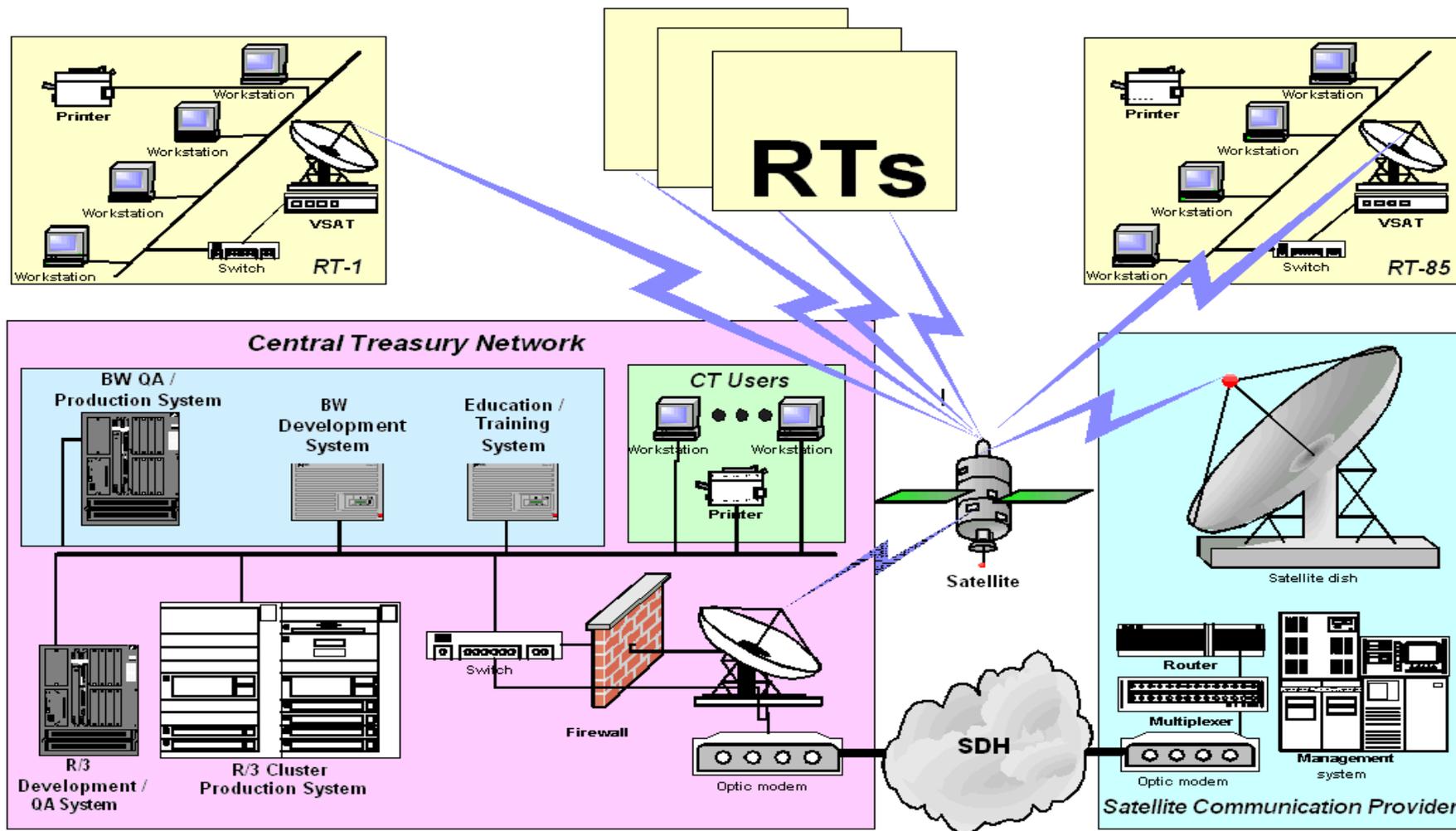
This method provides for server access from several independent SAProuter installations. When active router fails, the network redirects traffic to the standby one. This method provides stability of end-user connection.

3.4.2. Data Links reduplication

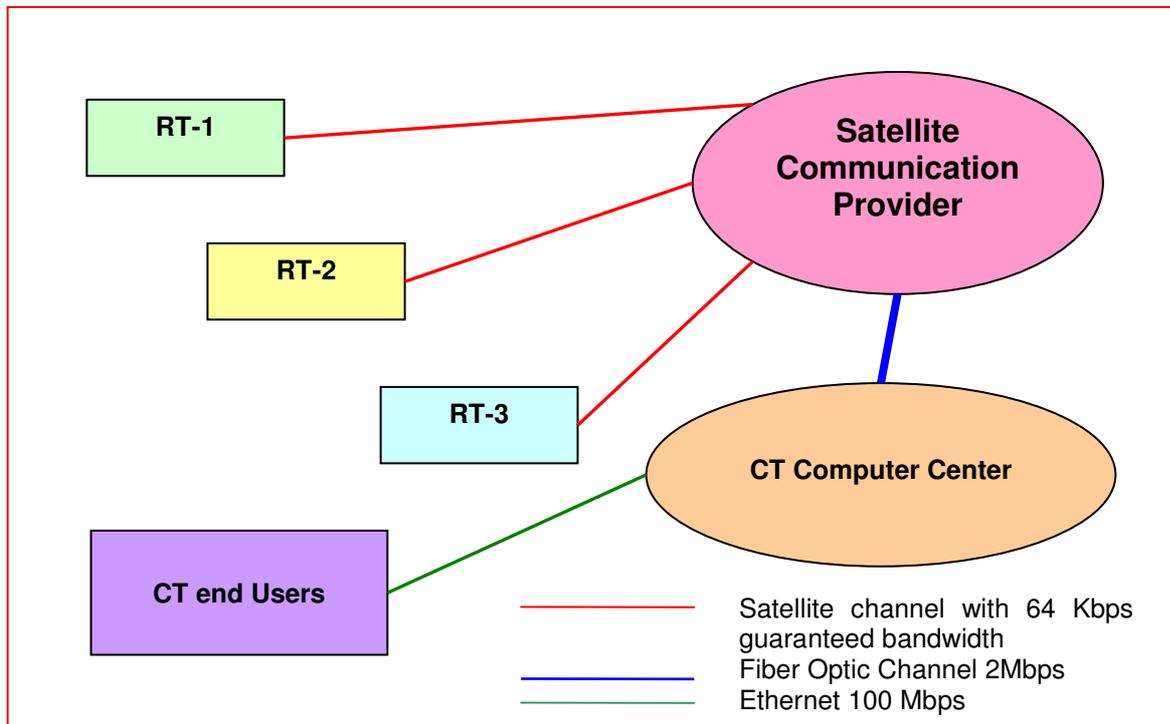
Besides physical reduplication of communication channels, it's advisable to use different types of WAN infrastructure (X.25, ISDN, etc.) If a single connection type is used, it's recommended to use different service providers for different channels, at least as a backup solution.

3.4.3. Treasure Network Architecture Proposed by Customer

Picture 5. Treasure Network Architecture.



Picture 6. Bandwidth of Treasure network segments.



The requirement to have several access points described in “Creation of Several Independent Access Points” could be met by a network services provider. Duplication of data transfer channels described in “Data Links reduplication” segment between the Central Treasury and communication services provider is foreseen via the satellite channel with a bandwidth of 512 Kbps.

The Central Treasury SAProuter must be installed at a connection point between the server network and the trunk channel leased by communication services provider.

For the regional offices communication services provider must install SAProuter as close as possible to a switching point between the office network and the satellite data transfer channel.

Considering that there is no requirement of real-time access from the regional offices to the project systems, and short-time interruptions in user activity are no critical, requirements by “Creation of Several Independent Access Points” and “Data Links reduplication” for remote users could be neglected.

3.5. Requirements for signal transit time over the data transfer channel

Signal transit time over the data transfer channel determines system response time for user’s actions, considerably influencing thus their work efficiency.

SAP gives the following table 13 recommendations for different types of data transfer channels.

Table 13. Different types of data transfer channels.

Channel	Bidirectional signal delay time (ms)
100 Mbps LAN	< 10
56Kbps Modem	250
Terrestrial WAN (Frame Relay,...)	250
Satellite	800

For the project especially important are recommendations for 100 Mbps LAN and satellite.

Real values have to be established during testing of data transfer channels as described in “Testing of Data Transfer Channels”.

3.6. Requirements for Data Transfer Channels Bandwidth Capacity

3.6.1. Requirements for Bandwidth Capacity of Data Transfer Channels between End User Workstations and SAP Application Servers.

Bandwidth capacity of data transfer channel has critical influence on the whole system operation.

Bandwidth capacity should be calculated on the basis of evaluation of data volume and data exchange intensity. SAP recommends the following formula for estimating the required bandwidth capacity of data transfer channels with the use of SAPGUI between the end users and SAP application servers:

$$C = X * N * D * 0.25, \text{ where}$$

- C – required bandwidth capacity in Kbps
- X – average data volume for one dialog step (kByte)
- N - number of active users (regardless of number of sessions)
- D – average number of dialog steps per user per minute

The bandwidth capacity should not be less than 56 Kbps to assure satisfactory interaction with the use of SAPGUI between end users workstation and SAP application servers.

At that SAP recommends that to assure satisfactory performance, channel utilization rate should not exceed 75 percent.

3.6.1.1. Requirements for Bandwidth Capacity of Data Transfer Channels between the Server Network and the Trunk Channel

To calculate the bandwidth capacity, the following could be assumed:

- The average data volume for one dialog step, as suggested by SAP Standard Note 62418, equals 3.8 KByte
- The average number of dialog steps per user per minute equals 10

Taking into consideration the requirements by “**Statement of Work**” document.

- Support of 300 competing users at the Treasury
- Support of 252 competing users at the Treasury regional offices according to Appendix 3 – “Required Number of Software Licenses Expressed in the Number and Type of Treasury End-Users” of “**Statement of Work**” document

The required bandwidth capacity of data transfer channels between the server network and the trunk channel would equal to:

$$C = 3.8 * 252 * 10 * 0.25 = 2394 \text{ Kbps.}$$

3.6.1.2. Requirements for Bandwidth Capacity of Data Transfer Channels between the Trunk Channel and the Treasury Regional Offices

Considering the supposed number of end users at the Treasury regional offices according to Appendix 3 – “Required Number of Software Licenses Expressed in the Number and Type of Treasury End-Users” of “**Statement of Work**” document and taking into account the formula for calculating bandwidth capacity given above, the required bandwidth capacity for each regional office should be no less than the value in the “**Required Bandwidth**” column in the table 14 below.

Table 14. Required bandwidth capacity for each regional office.



N	Group N	Site	No. of End-users	No. of Write Ability to Own Data Users	No of Read-only users	No. of Write Ability to All Data Users	Required Bandwidth(Kbps)
2	1	Khatai	6	4	2	0	57
3		Ganja	12	10	2	0	114
4		Khachmaz	6	4	2	0	57
5	2	Sheki	6	4	2	0	57
6		Zagatala	6	4	2	0	57
7		Oguz	4	3	1	0	56
8		Gah	4	3	1	0	56
9	2	Balakan	4	3	1	0	56
10	3	Khanlar	4	3	1	0	56
11		Samuh	4	3	1	0	56
12	4	Goranboy	6	4	2	0	57
13		Dashkasan	4	3	1	0	56
14		Kalbajar	4	3	1	0	56
15		Naftalan	3	2	1	0	56
16	5	Agdash	6	4	2	0	57
17		Zardab	4	3	1	0	56
18		Kurdamir	5	4	1	0	56
19		Gabala	5	4	1	0	56
20	5	Ujar	4	3	1	0	56
21	6	Lankaran	10	8	2	0	95
22		Masalli	6	4	2	0	57
23		Astara	4	3	1	0	56
24	7	Lerik	4	3	1	0	56
25		Yardimli	4	3	1	0	56
26		Jalilabad	8	6	2	0	76
27		Bilasuvur	5	4	1	0	56
28	8	Shamakhi	6	4	2	0	57
29		Ismayilli	5	4	1	0	56
30		Goychay	6	4	2	0	57
31		Gobustan	4	3	1	0	56
32		Agsu	4	3	1	0	56
33	9	Ali-Bayramli	5	4	1	0	56
34		Salyan	6	4	2	0	57
35		Sabirabad	6	4	2	0	57
36		Hajigabul	4	3	1	0	56
37		Neftchala	4	3	1	0	56
38	10	Tovuz	6	4	2	0	57
39		Gazakh	4	3	1	0	56
40		Agstafa	4	3	1	0	56
41		Shamkir	6	4	2	0	57
42		Gadabay	4	3	1	0	56
43	11	Imishli	6	4	2	0	57
44		Beylagan	6	4	2	0	57



45		Khojavand	3	2	1	0	56
46		Jabrail	3	2	1	0	56
47		Fizuli	4	3	1	0	56
48		Saatli	4	3	1	0	56
49	12	Guba	6	4	2	0	57
50		Gusar	4	3	1	0	56
51		Davachi	4	3	1	0	56
52	13	Barda	6	4	2	0	57
53		Agdam	4	3	1	0	56
54		Agjabedi	6	4	2	0	57
55		Lachin	3	2	1	0	56
56	14	Yevlah	6	4	2	0	57
57		Mingachevir	6	4	2	0	57
58		Khojali	3	2	1	0	56
59		Tartar	4	3	1	0	56
60	15	Nakhchivan MoF	10	8	2	0	95
61		Nakhchivan city	6	4	2	0	57
62		Ordubad	4	3	1	0	56
63		Babak	4	3	1	0	56
64		Shahbuz	4	3	1	0	56
65		Sharur	4	3	1	0	56
66		Julfa	4	3	1	0	56
67		Sadarak	3	2	1	0	56
68	16	Sumgayit	10	8	2	0	95
69		Gubadli	3	2	1	0	56
70		Absheron	4	3	1	0	56
71		Siyazan	3	2	1	0	56
72		Khizi	3	2	1	0	56
73	17	Baku	6	4	2	0	57
74		Sabunchi	6	4	2	0	57
75		Garadag	5	4	1	0	56
76		Surakhani	5	4	1	0	56
77		Binagadi	6	4	2	0	56
78		Narimanov	8	6	2	0	76
79	18	Nizami	6	4	2	0	57
80		Azizbayov	6	4	2	0	57
81		Susha	3	2	1	0	56
82		Zangilan	3	2	1	0	56
83		Nasimi	12	10	2	0	114
84		Sabail	10	8	2	0	95
85		Yasamal	12	10	2	0	114
86		MOXI	12	10	2	0	114

3.6.2. Requirements for Data Transfer Channels Bandwidth Capacity between System Landscape Servers

According to SAP recommendations, data transfer channels bandwidth capacity between system landscape servers should exceed on the average by the factor of ten (C*10) the LAN bandwidth capacity between user workstations and SAP application servers.

To reduce reserve backup procedures interference with SAP systems availability, an isolated server subnetwork with bandwidth capacity of 100/1000 Mbps has to be used.

3.7. Testing of Data Transfer Channels

On further project implementation stages it will be necessary to test communication channels in order to get a realistic overview of communication channels capacity. Usually test solves the problems:

- Determines bandwidth
- Determines speed of data transfer
- Determines the channel quality (admissible number of faults)
- Checks the data transfer channels switchover pattern from the main channel to a backup channel (if channel backup is provided for)

All those tasks are performed both for trunk channel segments and for so-called “last mile” from the connection point between trunk channels at the service provider and up to the access point to general use network. Testing is performed both for main and reserve channels (if channel duplication is provided for by the project).

At the end, overall SAP applications operability test at the end users workstations is performed.

Usually for the test purposes a Data Transfer Channels Testing Program is created that reflects:

- Testing objectives:
- Test objects
- Testing parameters
- Requirements for test objects
- Testing methods and instruments
- Methods for evaluating testing results
- Testing reliability criteria
- Testing scenarios
- Testing participants
- Testing schedule
- Testing results

In case testing results for data transfer channels are not satisfactory, the Customer has to take measures to improve the quality of data transfer channels.

4. TIMS System Environment requirements

4.1. Server Hardware

Purchasing of server hardware is based on system landscape defined by project scope.

At project beginning minimal TIMS technical infrastructure requirements should be performed. Appendix 1 Minimal TIMS technical infrastructure requirements should contain general characteristics of server hardware. Minimal TIMS technical infrastructure requirements should perform together with SAP hardware provider. “Appendix 1. TIMS Minimal server hardware requirements ” contains minimal TIMS server hardware requirements to provide system response time according SW requirements. Minimal server hardware requirements has been performed using SAP Quick Sizing. This server hardware requirements should be make more precise by SAP hardware provider.

Results of SAP Quick Sizing were formed according user-based initial data and quality structure that were based on SW. In case of changing of initial data minimal TIMS server hardware requirements should be recalculated according SAP Quick Sizing. SAP is not responsible for changing of initial data that entail changing of minimal TIMS server hardware requirements.

It is necessary to point that minimal requirements provide system response time according SW requirements only at condition of operation of SAP standard functionality. Therefore TIMS technical infrastructure requirements should be changed at condition additional local development.

After the equipment has been selected, installed and configured, its properties must be recorded in corresponding document.

4.2. Other Systems

4.2.1. System Backup Hardware and Software

The backup system must assure full copying and restoring of OS and SAP system data.

For backup copying operations SAP software, together with other vendors software certified for backup copying of SAP systems, must be used.

Backup copy equipment must:

- Assure copying and restoring time parameters according to the defined backup strategy
- Be able to share equipment (tape drives) and have an interface for work with standard SAP AG software
- Assure creation of at least two copies of the same data batch without consecutive multiply copying
- Have versatile diagnostics, monitoring and recording tools
- Assure simple and reliable operation, minimal setting up and administering time

4.2.2. Overview of Other Systems

Besides SAP systems in the system environment could be present servers of other systems providing work environment in the enterprise. Usually there are:

- File servers of local Public Data networks (local corporate networks) on the enterprise.
- Print servers or network printers with built-in NICs.
- Non-SAP application servers, which will be eventually integrated with SAP applications.

For this project it is intended to use at least one file server and several print servers.

5. TIMS Requirements for Server Location and Power Supply

Server equipment must be located at specially designated premises.

Access to the server room must be regulated. The room must be equipped with unauthorized access warning system.

All the servers must be backed by uninterruptible power supply units of sufficient capacity to protect from voltage swings and must have compatible software to assure safe system shutdown. Server equipment must have two independent electric power supply lines of required capacity.

Air conditioning must be assured according to the vendor specifications and technical standards depending on maximum heat emissions by the servers and optional equipment installed in the server room. Air conditioning should also be assured with regard to relevant sanitary and technical norms and standards.

All the server peripherals must be selected with a regard to the necessity of integration into the existing infrastructure.

The server room must be equipped with fire extinguishing system.

6. TIMS Desktop Computer Environment

To assure project team and end users productive work it is essential to make a right choice of desktop computers at which SAP systems software and office software will be installed.

All user desktop computers must run Microsoft Windows 2000 Professional OS or other OS supported by SAP as platform for SAP GUI. Desktop computers must not run applications that could interfere with SAP GUI correct work. Virus protection software must be used to assure desktop computers virus safety.

7. TIMS Development Planning requirements

7.1. Overview

It's recommended to separate a development subproject of the implementation project. This is necessary due to development specifics in general and customer development by SAP in particular.

The development subproject creation is accompanied by development of the documentation package described in the iterative helical product lifecycle model, which can be applied both to the entire subproject and to each of its tasks. This model is an adaptation of the existing in the SAP customer development projects model within the bounds of the HORIZON project (<https://rumowws1.mow.sap.corp/horizon>), which declares SAP Global Development Processes. This project conforms to the Product Innovation Lifecycle strategy (<https://rumowws1.mow.sap.corp/pil>), company's development manifesto from the point of view of phase and process descriptions.

The rationale for the customer development formalization is presented at <https://rumowws1.mow.sap.corp/custdev>.

SAP Global Development Processes comply with ISO 9001:2000 standard, which in its turn is represented in the software development area by ISO/IEC 12207, "Standard for Information Technology — Software Life Cycle".

Subproject scope is determined by the list of tasks, which constitute the work breakdown structure and its development expenses. Both the list and the expenses must be defined together with a subproject leader and must be used as a base for the so called subproject development contract, where the subproject size must be defined with maximum detail possible.

7.2. Packages (Development Classes)

It's recommended to create unified development classes within the project framework. Their names and organizational principles should be determined after the definition of the development subproject size and the development team.

7.3. Life Cycle Phases

Iteration of the full life cycle of the subproject within the offered model is divided into the following main phases:

1. Customer's decision on the development.
2. Definition of the customer's business requirements.
3. Coordination of the specifications with the customer, test package definition to estimation of correspondence results of development and specifications.
4. Software architecture design.
5. Implementation (development of the program code and documentation, data preparation), internal tests.
6. Integration.
7. Verification of the project implementation for compliance with the specifications, integration testing by the customer.
8. Product commissioning procedure.

7.4. Satellite technical requirements

Using a network connection over satellite link for interactive applications always introduces some additional increase of the response time. The delay is due to the speed of light. Typically, a satellite connection takes about 700 milliseconds for every roundtrip between client and server.

This delay is present for any application used over a satellite connection.

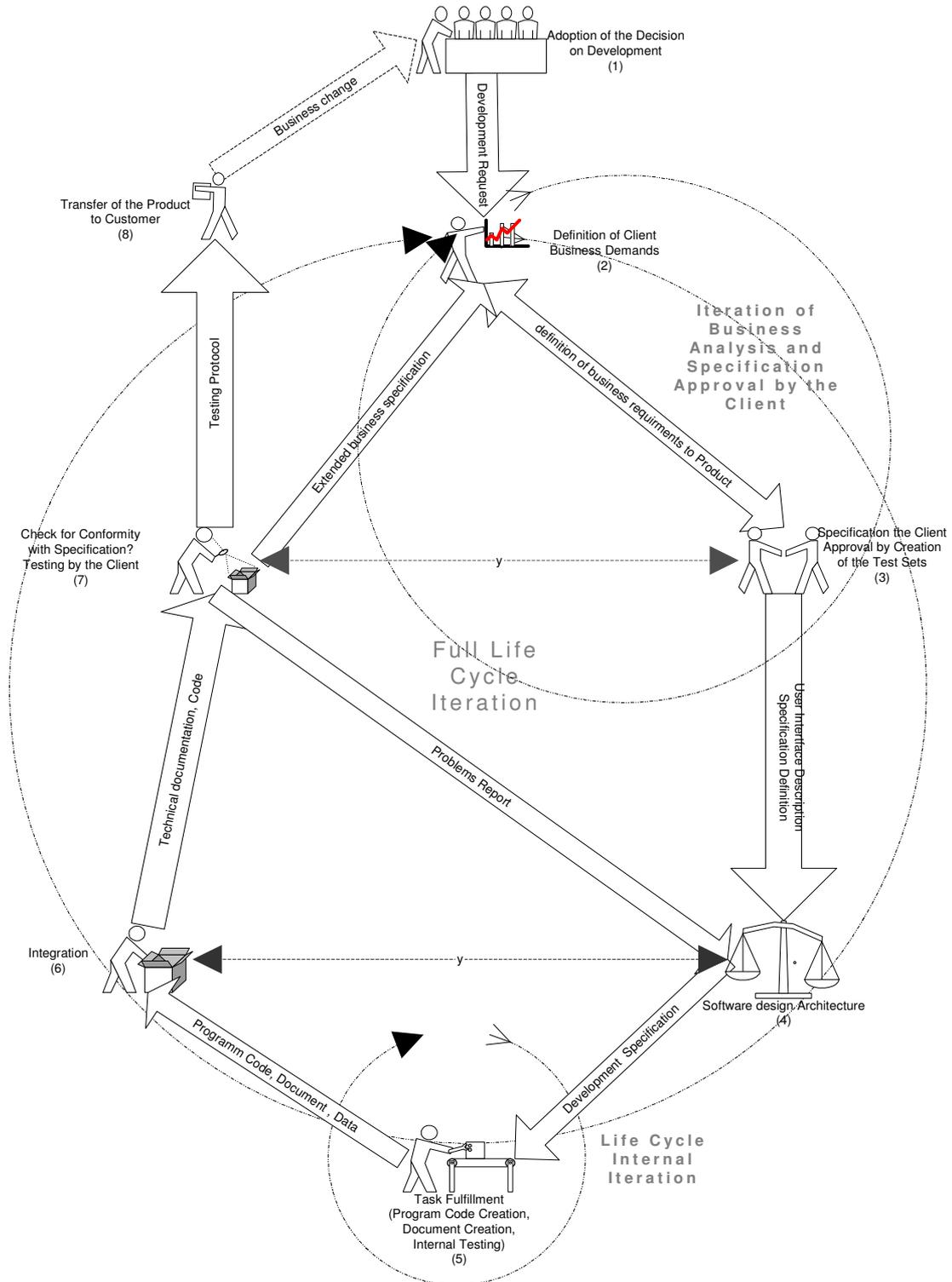
Before using an application over a satellite connection, should investigate how many communication steps(number of round-trips) are used by the specific transactions needed by users. In general, a transaction with more than 2-3 round-trips per dialog step (network delay exceeds 2 seconds on a typical satellite connection) has to be considered "not suitable for satellite". Even transactions with a higher number of round-trips can be used over satellite if the end-users are willing to tolerate the higher response times.

The delays that are caused by the speed of light when using satellite connections cannot be overcome.

7.5. Model Workflow Diagram

On following picture 7 model workflow diagram of development organizational is represented.

Picture 7. Model workflow diagram of development.



8. TIMS Support Services requirements

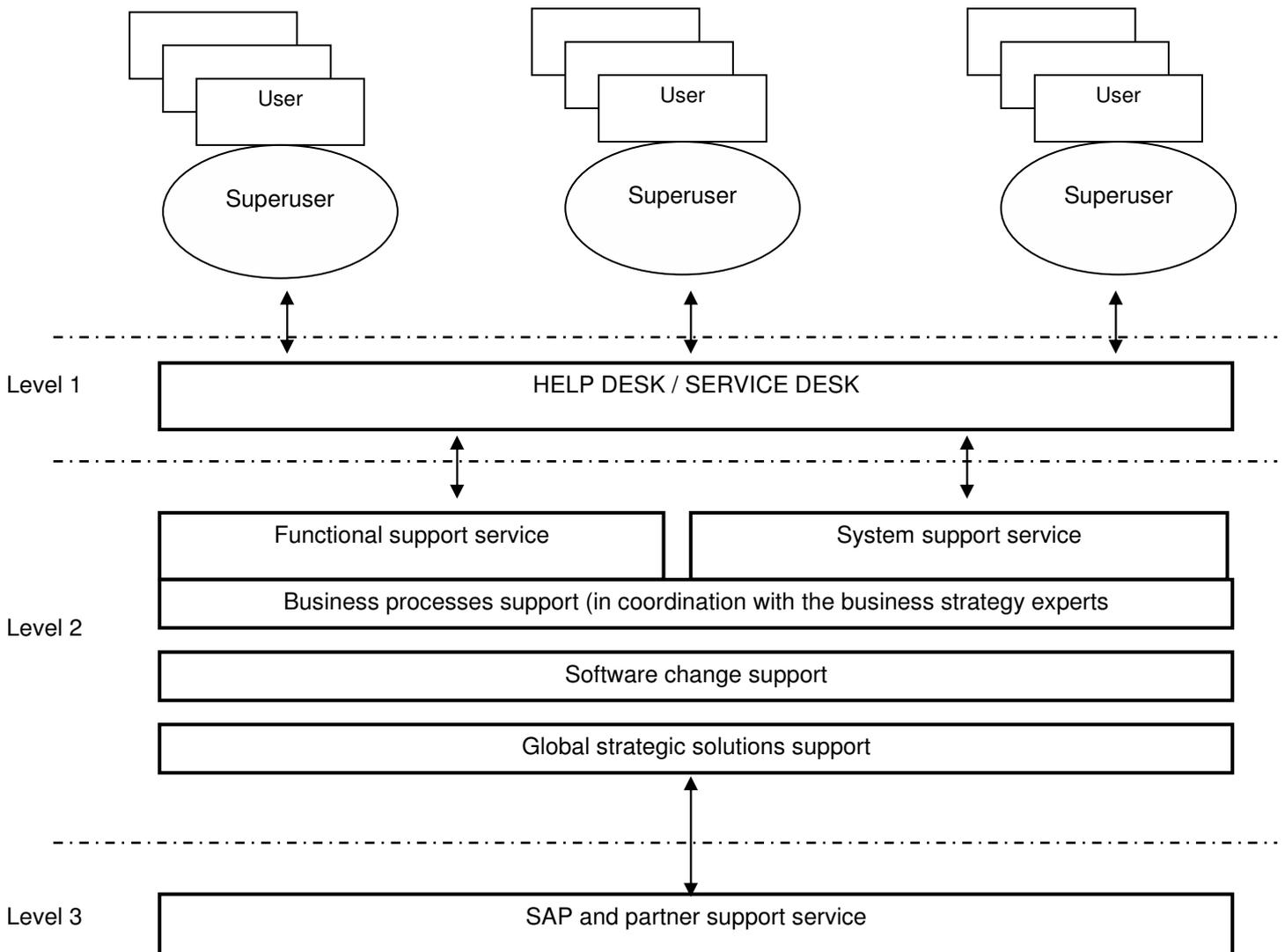
8.1. General

In the course of productive operation SAP recommends to organize the system support and maintenance on the basis of the Competence Center or the Help Desk. These solutions are the most effective and based on best practices in maintenance and support for mySAP Business Suite from SAP AG. The Help Desk usually supports the following functions:

- End user support.
- Functional improvement on the basis of requests of business methods experts from organization departments.
- Functional improvement project support.
- Technical support, system and functional monitoring.
- Development requests coordination.
- Training.
- Information management.
- Software and documentation maintenance.

The following multi-level support structure is recommended that represented on picture 8.

Picture 8. Recommended support structure.



Levels 1 and 2: internal support by the help desk.

Level 3: external consulting support.

Help desk activities must be regulated in a separate document called "Help Desk Regulations".

8.2. End User Support

One of the core functions by System Support Service is creation of an infrastructure supporting processing of issues and problems relevant to the System operation and development. To perform that function, System Support Service must have an End User Support Unit within its structure. As a variant, End User Support Unit could manage primary processing of user requests on hardware, network, OS and database issues. The experts use their experience with SAP products and knowledge of corporate businesses to answer the users' questions. If the question could not be answered within System Support Service competence, End User Support Unit resorts to other SAP support services.

Main functions of End User Support Unit are to receive and register end user requests concerning system operation problems, and to assure that those requests are fulfilled.

As a rule, End User Support Unit deals with the following:

- Questions concerning implementation of business processes in the System
- Questions concerning SAP software
- Questions concerning support of regulatory and reference information
- Coordination of development requests

In the absence of specialized services, End User Support Unit might as well fulfill some other functions, namely:

- System and application software at the end users' workstations
- Databases
- Computer equipment and peripherals
- Network and telecommunications equipment

End User Support Unit work must be guided by the relevant regulations that need to reflect:

- Procedure of request submittal by users
- Procedure of requests registration and processing by End User Support Unit
- Classification and processing route definition
- Determination of processing priorities
- Criteria of resorting to extra resources
- Procedure for request fulfillment monitoring
- Procedure for notification about request fulfillment
- Regulations for maintaining the knowledge base of solved problems
- Software used for automating End User Support Unit processes

To optimize end user support processes a structural unit could assign a person responsible as key, or super user, for the following functions:

- Accepting and grouping requests from the structural unit end users
- Assessing the need to send a request to End User Support Unit
- Consulting end users at the workplace
- Sending requests to End User Support Unit
- Communication of information to end users
 - About most common mistakes in their work in the system
 - About changes in the work of End User Support Unit
- Initial user training

8.3. Technical Support, System and Functional Monitoring

System Support Service assures fulfillment of the following tasks related to the System environment:

- User administration
- System administration
- Transport Requests administration
- Background tasks launching
- Data backup and restoring
- Programming
- Database Administration

- Operating System Administration

8.3.1. User administration

To support user administration functions effectively, relevant regulations corresponding to the Authorization Concept adopted for the project, should be worked out.

The regulation must govern the following:

- a) Creation and change of user master records
- b) Blocking and reinstating users, password changes

User roles and profiles are shaped according to the adopted Authorization Concept.

8.3.2. Monitoring of Safety Rules Breaches

Monitoring of safety rules breaches is done by the respective administrator with regard to requirements by the corporate documents, regulating information security procedures.

8.3.3. System administration

In the process of system administration daily, weekly and monthly checks are performed. At that, various logbooks of SAP systems, database and operational system are monitored. Moreover, the system performance is measured regularly. All the works are carried out according to "TIMS Monitoring and Capacity Evaluation Strategy requirements" of this document.

8.3.4. Transport Requests Administration

The procedure for transferring Transport Requests from system to system is defined by the relevant regulation that governs how to create Change Requests and designates persons responsible who have the right to create such requests, release them and import them into other systems.

8.3.5. Background Tasks Launching

The procedure for background tasks launching and launch conditions are defined in a relevant document.

8.3.6. Data Backup and Restore

The procedure for data backup and restoring for all systems must be guided according to "TIMS Backup Strategy requirements".

8.3.7. Programming

Programming is the most important technical support element. This includes:

- Adding support packages to the systems
- Addition of changes from Online System Support (OSS) in compliance with SAP notes
- Change of existing or addition of new ABAP Dictionary elements

8.3.8. Database Administration

Database Administration includes database administration as such and monitoring of the database operability and efficiency. Those issues are governed by Systems Technical Support Regulation.

8.3.9. Operating System Administration

Operating system administration includes: Control over the access to OS, creation and change of OS user parameters, management of tasks relevant to OS. Those issues are governed by Systems Technical Support Regulation.

8.3.10. Approximate List of Activities by Technical Support Service

8.3.10.1. Occasional (on demand)

1. Client copying
2. Client change, creation, deletion
3. ALE model change, creation, deletion, distribution
4. User change, creation, deletion

5. Role change, creation, deletion
6. Transport Request transfer
7. Transport Request creation, deletion, change, release
8. System reloading
9. System backup copy creation on demand
10. Planned backup copy restoring
11. Emergency backup copy restoring
12. Applying support packages to the system
13. External Transport Requests import
14. External Transport Requests export
15. Search for SAP Notes on a specific problem
16. Creation and tracking messages in OSS
17. Application of SAP Notes
18. Hardware systems troubleshooting
19. Network systems troubleshooting
20. Support of users and directories on application servers to provide interfaces with other systems
21. Providing external access to the Project systems

8.3.10.2. Periodical

1. Data Backup and Restoring
2. Database administration
3. Operating system administration
4. Managing the system user mailing list for e-mail
5. Monitoring and audit activities within the strategy bounds.

8.4. Training

Training forms the base for end user successful work. Training preparation requires:

- To work out training concept
- To create training environment, training materials and long-term training schedule

If required, System Support Service could resort to outsourcing to cover training needs. As training material, information from SAP Knowledge Warehouse could be used.

8.5. Information Management

Information management includes procedures for distributing information on SAP decisions intra-enterprise, as well as internal marketing.

Internal marketing promotes System Support Services.

System Support Service organizes seminars and discussions, makes presentations, arranges information sessions and distributes information intra-enterprise.

System Support Service experts take part in conferences devoted to SAP solutions support and improving work of certified Competence Centers.

8.6. Maintenance of Program and Documentation Fund

Maintenance of Program and Documentation Fund is one of System Support Service functions comprising:

- Archives (distribution kits with source texts or program loading codes and project documentation)
- Documentation on filing materials to Program and Documentation Fund
- Protocols on commissioning of templates, system versions, reference guides, etc.
- Warranties by software developers
- Copies of agreements (contracts) with vendor or developer company
- Copies of powers of attorney to company representatives for the software receipt for further installation
- Documentation for local software products commissioned before System Support Service was created
- Distribution kits for reference guides used in the systems
- Description of system tests and test results

- Regulatory, administrative and tutorial materials

9. TIMS Authorization Concept requirements

9.1. General

An authorization concept must be elaborated that would define policy and standards for creating user master records in a way enabling user access to all the required functions on one hand, and preventing unintended or unqualified changes to the system on the other hand.

Authorization concept for the end users shall be formulated at a later stage of project implementation basing on the information on organizational changes.

Creation of an authorization concept describing authority generation for the project office team is especially important at the project start-up stage. The concept must assure further smooth project implementation.

Despite the fact that the Authorization Concept describing authority generation for the project office team is created for the duration of the project implementation and serves primarily project team needs, it should be clear from the beginning that it would constitute the foundation for the elaboration of the authorization concept at the live operation stage.

Authorization concept must be adopted as a separate document that shall include:

- Level and composition of governing bodies from the Client that would coordinate and approve distribution of authority in the system
- Procedures for the creation and change of relevant user authority in the system
- List of actions and responsibility over distribution of authority in the system

After the initial installation of the development system SAP user block comprises different user categories, and each must have its own authorization set.

9.2. Authorization Concept Principles for the Project Office Team

For the project office team, from the beginning the set of roles must be defined. The roles would be derived from a project office team member basic role that, in its turn, is created on the basis of *SAP_All* profile by deleting all the authorizations critical for the system administration. Namely, those authorizations are:

- System authorization: Network administration (SM54, SM55, SM58, SM59)
- System authorization: Process administration (SM50, SM51, SM04)
- Background tasks interruption
- Table T000 maintenance
- Client administration
- Update requests administration (sm13)
- Operating system commands execution
- Execution of operating system commands from R/3
- Usage of CCMS (instances start-up and shutdown, switching between work modes (day or night), system status check-up, etc.)
- Changing attributes of closed output request (printer type, print job format, request storage time)
- Deletion of an output request by a non-current user
- Redirecting of an output request by a non-current user to another printer (of the same type)
- Repetitive execution of closed output request by a non-current user
- Maintenance of non-own TEMSE objects
- Creation, change, deletion, reactivating, viewing change documents and archiving of user master records
- Creation, change, deletion, reactivating, viewing change documents and archiving of profiles
- Change, deletion, reactivating, viewing change documents and archiving of roles

- Import of Transport Requests between systems
- Transport Requests queue administration
- Changing values in debugging mode

User are divided into categories on the principle of functionality and/or responsibility (for example, “Team Leaders” or “Development Team Members”, etc. For each category roles are created by deleting certain authorizations from a base role.

9.3. Limiting the Number of Users with Broad Authority

The number of user with critical access authorizations (with *SAP_ALL* profile) must be limited to a minimum. Accessing SAP systems with critical authorizations must be permitted only to the members of the administrative team. The degree of responsibility in using those records must be the same as degree of responsibility for using the system administrator record at the level of the operation system.

9.4. Role and Profile Development Life Cycle

At the live operation stage it is administrative team that develops authorization roles and profiles in the Development System. Before transferring to the Productive System, the roles and respective authorization profiles are transferred into the Quality Assurance System for the final testing. User master records could be created in the Production System closer to live operation start-up. Roles and authorization data transferred from the Development System into the Quality Assurance System and into the Production System are assigned to users in conformity with User Administration Regulations.

9.5. Cooperation with Technical Support Service

Authorizations administrator must work in close contact with Technical Support Service administrators.

The system environment, Client environment and roles must be clearly defined and presented to the project team members. For all new developments, development classes and authorization groups must be defined. All administrators must absolve SAP training course on organization of tools, transfer systems and updates.

On Client copying it must be taken into account that end users, roles, authorization profiles and the authorizations themselves are Client-dependent.

In their work administrators must be guided, inter alia, by “Client Management Strategy” and “Transport System TIMS Organization requirements”.

9.6. Cooperation with the Development Team

Authorizations administrator must work in close contact with the developers to facilitate embedding of new security standards into new ABAP programs and operations. An authorization category must be attributed to any new user program through ABAP Editor Attributes screen (operation). Those standards must be reflected in the documentation detailing development organization (see “TIMS Development Planning requirements”).

10. TIMS Backup Strategy requirements

Data Backup and Restoring are critical elements in assuring data integrity. For that purpose it is necessary to assure planning, start-up and monitoring of tasks for copying SAP database and operating system files.

Backup strategy shall be formulated at a later stage of project implementation.

System backup must be done according to the defined strategy at the existing equipment. Apart from the existence of the copied data, an estimate for the time required for system recovery from a reserve copy is needed.

Reserve copies also need to be periodically checked both for the possibility of recovery and for the copied data integrity (for so-called bad clusters).

Together with the backup, archive logbooks must also be copied. Recommended strategy: double copying of logbooks on different media with subsequent source deletion or truncating.

Besides, it is necessary to organize elaboration, testing and execution of the plan for SAP systems recovery as well as creation of scenario file sets allowing restoring the system operability under diverse conditions. Apart from the scenario files, step-by-step system recovery procedures must be drilled.

The required data set:

- OS backup files
- Backup files or installation discs of the database software.
- Backup files or installation discs of SAP systems.
- Database backup as such.
- Archive logbooks

In order to guarantee successful data recovery after failures, backup strategy for each system must be worked out, detailing:

- List of system components to backup
- Backup copy retention period
- Backup schedule and periodicity for every component
- Backup accuracy control tools and methods
- Backup copy control restore schedule to check consistency
- Backup tools.

List of backup objects:

- Operating system and installed software on the file system level
- Database on the file level
- SAP System catalog contents and database on the file level
- Transaction journal on the file level
- Transport catalogue contents on the file level.

11. TIMS Monitoring and Capacity Evaluation Strategy requirements

Monitoring and capacity evaluation strategy will be developed in order to provide effective system operation and early problem prevention measures. The strategy shall include the following:

- List of components under test
- Methods and tools of analysis and checking
- Schedule and periodicity of the system audit

List of periodic processing on monitoring and audit.

11.1. Approximate List of Periodic Processing on Monitoring and Audit.

11.1.1. Daily

1. mySAP system operability check
2. Network operation check
3. The system daily backup result check
4. Application server accessibility check
5. The system uncompleted/erroneous updates check
6. The system log error check
7. Unsuccessfully completed background job check
8. Review of the system user lists
9. Problem printing check
10. The system load statistics check
11. mySAP working process operability check
12. mySAP memory space check
13. Database memory space analysis
14. Database error log check
15. Disk loading check.

11.1.2. Weekly

1. Database size increase monitoring
2. Database statistics update

3. Operating system work check

11.1.3. Monthly

1. File systems use monitoring
2. Checking reading time from the database files
3. Checking database parameters for conformity with current system utilization
4. Table access analysis
5. R/3 working processes analysis
6. Free block timeout analysis.

12. TMS Support Packages Application Strategy

Support packages regularly released by SAP are designated for debugging discovered faults in the systems operation. There are two types of support packages:

- Kernel patch package
- Functional support package

Applying support packages to the system shall be based upon the following rules:

- Support packages shall be applied in conformity with SAP recommendations
- Kernel patch could be applied to momentarily shutdown systems only
- Support package shall be applied only during minimum system activity. It is required that all the users exit from the system. During the application of support package:
 - All application servers, with the exception of the Central Instance, must be shut down
 - Users must be blocked from logging in the system for the duration of support package application
- Support package could be imported only through SAP Software Patch Administrator (SPAM). SPAM would define all the changes and propose the setting in case of conflicts. It is recommended to use the latest SPAM version.
- Support package shall be applied only after studying the latest information on its use.
- During the time span between application of support packages for the Development System, Quality Assurance System and Production System import of any Transport Requests into those systems is inadmissible. Import of Transport Requests could be possible only between the systems with same support package level.

Within the project framework, support packages shall be applied in conformity with the following procedure:

- Applying support package to the Development System
- Initial analysis of the support package application according to standard business processes. Possibly, rework of standard modified SAP objects or expansion projects, affected by the support package, would be necessary. Additional rework must be included in the Transport Request
- Applying support package to the Quality Assurance System
- Detailed analysis of the support package application according to standard business processes. In case rework of standard modified SAP objects or expansion projects, affected by the support package, would be necessary, such rework must be carried out during the development process. Additional rework must be included in the Transport Request
- Applying support package to the Productive System and import of the reworks to the Productive System (if any).

13. SAP Services and Production Support Strategy

SAP may provide service after creating of customer's Support Service using SAP's strategy of maintenance «5-1-2 maintenance»:

- 5 years of mainstream maintenance at standard maintenance fee

- 1 year of extended maintenance at additional 2% fee
- 2 years of extended maintenance at additional 4% fee per year

SAP Service Support:

- SAP Consulting
- SAP EarlyWatch®
- SAP Local Support
- SAP Solution Service
- SAP Quick Sizing
- Education Service
- SAP GoingLive™

14. TMS Technical Security Strategy requirements

Technical Security Strategy should be designed as formal document and provide:

- Effectiveness of system;
- reliability financial and management accounting;
- confidentiality of data;
- correspondence of legislation requirements.

Technical Security Strategy has some levels:

- hardware and software level (equipment; network; operation system);
- database;
- application servers and client workstation.

Technical Security Strategy should be founded on SAP standards and recommendations described in SAP document "SAP Security Guide". .

Technical Security Strategy should be described:

- User Authentication:
 - passwords policy;
 - Protecting Standard Users
 - Preventing Unauthorized Logons
 - Preventing multiple Logons of dialog users;
 - Security Measures When Using SAP Shortcuts
- Authorization Concept
 - Special profiles protection
 - Roles maintenance
 - Check authorizations
 - Authorization Infosystem
 - Central User Administration
- Network Infrastructure:
 - Standard encryption requirement
 - Network Topology
 - Network Services
 - Routers and Packet Filters
 - Firewall and SAProuter
- Operating System Protection
 - Protecting Specific UNIX Properties, Files and Services
 - Setting Access Privileges for R/3 Under UNIX
- Logical Operating System Commands in R/3
- Database Access Protection:
 - Access Using Database Tools
 - Database Standard Users
 - Setting Access Privileges for Database-Related Files and Directories
- Protecting Productive System (Change & Transport System)
 - System Landscape
 - Defining the Transport Process
 - Responsibilities and their Corresponding Authorizations
 - Protection of RFC connections
 - Protection of critical objects
 - Necessary changes in the Productive System

-
- Interfaces:
 - Remote communications (RFC & CPI-C)
 - Application Link Enabling (ALE)
 - Background tasks
 - Batch input
 - Log maintenance and audit
 - Audit Info System (AIS)
 - Security Audit Log
 - System log
 - CCMS statistical data
 - Recording of unusual activities
 - Some other protection points
 - Data safety considerations while using Remote Support Services
 - Infrastructure anti-virus protection
 - Prevention or logging of data uploads

A. Appendix 1. TIMS Minimal server hardware requirements

Minimal server hardware TIMS requirements has been performed using SAP Quick Sizing. Initial data for SAP Quick Sizing has been performed using supposed organizational structure of Project Office and document SW.

A.1 Server hardware requirements for system MFD

Initial data for SAP Quick Sizing has been performed using supposed organizational structure of Project Office.

User-based initial data of system MFD

	Concurrent Users		
	Low ¹	Medium ²	High ³
FI		5	5
MM		5	5
BC			12
BWP			1

SAP Quick Sizing results.

Main Memory of Database and Application Server in MB	
Application server	1024
Database server	512

User-based sizing categories ⁴ at 65% CPU utilization (32% are attributed other activities)			
CPU ⁵	03	Disk ⁶	03

A.2 Server hardware requirements for system MFQ

Initial data for SAP Quick Sizing has been performed using supposed organizational structure of Project Office and supposed quantity of training users.

User-based initial data of system MFQ

	Concurrent Users		
	Low	Medium	High
FI		12	2

¹ An occasional user is logged on and consumes system resources. We assume that the occasional user accesses the system from time to time, fitting the work profile of an information user or an executive. From a technical viewpoint, this user type typically performs around 400 dialog steps (equivalent to approximately 400 screen changes) per week. Assuming a working week of 40 hours, this amounts to ten dialog steps per hour or one every six minutes. In this column you enter the number of users who are logged on and use it every once in a while during the day.

² We assume that this user definition represents the work profile of accountants, clerks or office personnel. From a technical viewpoint, this user type typically performs around 4,800 dialog steps per week. Assuming a working week of 40 hours, this amounts to 120 dialog steps per hour or one every 30 seconds. In this column you enter the number of users who are logged on and use it regularly during the day.

³ We assume that this user definition represents the work profile of users in the telesales environment, data entry users or power users such as application developers. From a technical viewpoint, this user type typically performs an average of around 14,400 dialog steps (screen changes) per week. Assuming a working week of 40 hours, this amounts to 360 dialog steps an hour or on every 10 seconds. In this column you enter the number of users who are logged on and use it intensively during the day.

⁴ The results are calculated to meet an average CPU utilization of 65%. 33% of this utilization are attributed to dialog processing and 32% are attributed to resource consumption caused by other activities such as batch, reporting, printing, and possible interfaces.

⁵ CPU Categories CPU are described in "CPU and Disk categories".

⁶ Disk Categories CPU are described in "CPU and Disk categories".

MM		12	2
BC			12
BWP		2	2

SAP Quick Sizing results.

Main Memory of Database and Application Server in MB	
Application server	1280
Database server	512

User-based sizing categories at 65% CPU utilization (32% are attributed other activities)			
CPU	03	Disk	03

A.3 Server hardware requirements for system MFP

Initial data for SAP Quick Sizing has been performed using document SW.

User-based initial data of system MFP.

	Concurrent Users		
	Low	Low	Low
FI	50	40	20
MM	85	55	20
BC		5	
BWP	10	10	5

Quantity structure of system MFP.

Component & Object	Number of Objects Created per Year	Sub-Object of the Object	Retention Period [Months]	Highload Phase		Object Changes (%)	Object Display (%)
				Number of Objects Created per Day	Execution period [hh:00 - hh:00]		
FI Documents	30,000,000	Line items	24	100,000	09:00-18:00	20	100
MM-PUR Purchase Orders	3,600,000	Line items	24	12,000	09:00 -18:00	20	100
MM-IM Materials Movements	3,300,000	Line items	24	11,000	09:00 -18:00	20	100
BC Printed documents	1,350,000			4,500	09:00 -18:00	20	100
BWP Business Work Place	900,000		24	3,000	09:00 -18:00	20	100

SAP Quick Sizing results.

Main Memory of Database and Application Server in MB	
Application server	3840
Database server	1024

User-based sizing categories at 65% CPU utilization (32% are attributed other activities)			
CPU	04	Disk	06

Quantity-structure based sizing categories ⁷ at 65% CPU utilization			
CPU	06	Disk	12

A.4 Server hardware requirements for system BWD

Initial data for SAP Quick Sizing has been performed using supposed organizational structure of Project Office.

User Activity		
InfoConsumer ⁸	Executive ⁹	Power User ¹⁰
0	0	5

Data Upload		
Number of uploaded objects (taken from periodic runs below)	Upload period in hours	Mark, if upload runs parallel to queries
8500	40	

⁷ These results stem from your input in the screens for quantity structure. The sizing categories obtained from the expected data throughput of the SAP system is calculated to meet an average CPU utilization of 65%, thus enabling good response times at a relatively high consumption.

⁸ view predefined and static reports

⁹ navigate within reports, do slicing and dicing, but usually hit aggregates

¹⁰ run ad-hoc queries with a high probability of full table scans

These Entries determine the the record length of the InfoCubes				These Entries determine the total number of records in the InfoCube		
Name	Type (predefined or self defined)	Dimensions	Key Figures	Initial Load	Periodic Load	No. of Periods
OFIGL_C02		5		60	8500	52
OPU_C31M		5		60	8500	52
OPU_C02M		5		60	8500	52
OFIGL_C02		5		60	8500	52

ODS Object (for Disk Sizing)					
Name	No. of Numeric Fields	No. of Char. Fields	Initial Load	Periodic Load	No. of Periods
OPU_043			60	8500	52
OPU_042			60	8500	52
OPU_041			60	8500	52
OPU_0444			60	8500	52
OFIGL_002			60	8500	52

SAP Quick Sizing results.

SAP BW Sizing Results			
<u>DB Server Memory in MB</u>	<u>App. Server Memory in MB</u>	<u>CPU Category</u>	<u>Disk category</u>
000768	000512	04	01

A.5 Server hardware requirements for system BWQ

Initial data for SAP Quick Sizing has been performed using supposed organizational structure of Project Office.

User Activity		
InfoConsumer	Executive	Power User
10	3	2

Data Upload		
Number of uploaded objects (taken from periodic runs below)	Upload period in hours	Mark, if upload runs parallel to queries
8500	40	

--	--	--

These Entries determine the the record length of the InfoCubes				These Entries determine the total number of records in the InfoCube		
Name	Type (predefined or self defined)	Dimensions	Key Figures	Initial Load	Periodic Load	No. of Periods
OFIGL_C02		5		60	8500	52
OPU_C31M		5		60	8500	52
OPU_C02M		5		60	8500	52
OFIGL_C02		5		60	8500	52

ODS Object (for Disk Sizing)					
Name	No. of Numeric Fields	No. of Char. Fields	Initial Load	Periodic Load	No. of Periods
OPU_043			60	8500	52
OPU_042			60	8500	52
OPU_041			60	8500	52
OPU_0444			60	8500	52
OFIGL_002			60	8500	52

SAP Quick Sizing results.

SAP BW Sizing Results			
<u>DB Server Memory in MB</u>	<u>App. Server Memory in MB</u>	<u>CPU Category</u>	<u>Disk category</u>
000768	000512	03	01

A.6 Server hardware requirements for system BWP

Initial data for SAP Quick Sizing has been performed using document SW.

User Activity		
InfoConsumer	Executive	Power User
120	60	5

Data Upload		
Number of uploaded objects (taken from periodic runs below)	Upload period in hours	Mark, if upload runs parallel to queries
173,000	40	

These Entries determine the the record length of the InfoCubes				These Entries determine the total number of records in the InfoCube		
Name	Type (predefined or self defined)	Dimensions	Key Figures	Initial Load	Periodic Load	No. of Periods
OFIGL_C02		5		1,200	173,000	52
OPU_C31M		5		1,200	173,000	52
OPU_C02M		5		1,200	173,000	52
OFIGL_C02		5		1,200	173,000	52

ODS Object (for Disk Sizing)					
Name	No. of Numeric Fields	No. of Char. Fields	Initial Load	Periodic Load	No. of Periods
OPU_043			1200	173,000	52
OPU_042			1200	173,000	52
OPU_041			1200	173,000	52
OPU_0444			1200	173,000	52
OFIGL_002			1200	173,000	52

SAP Quick Sizing results.

SAP BW Sizing Results			
<u>DB Server Memory in MB</u>	<u>App. Server Memory in MB</u>	<u>CPU Category</u>	<u>Disk category</u>
001024	000768	05	05

A.7 CPU and Disk categories

CPU Sizing Categories

Category	Up to (Number of SAPS ¹¹)
1	125
2	250
3	500
4	1,000
5	1,500
6	2,000
7	4,000
7+	> 4,000
8	6,000
9	8,000
10	10,000
11	12,000
12	14,000
13	16,000
14	18,000
15	Please contact a hardware partner of your choice or SAP

¹¹ SAP Application Benchmark Performance Standard 100 SAPS are equivalent to 2,000 fully processed order line items per hour, 6,000 dialog steps (screen changes) with 2,000 postings or 2,400 SAP transactions

Disk sizing categories

Category	Disk Range in GB
0	5 – 15
1	16 – 25
2	26 – 35
3	36 – 50
4	51 – 70
5	71 – 100
6	100 – 130
7	130 – 160
7+	Larger than 130
8	160 – 190
9	190 – 220
10	220 – 250
11	250 – 280
12	280 – 310
13	310 – 360
14	360 – 400
15	> 400

B. Appendix 2. SAP Confirmation letter for HW/RDBMS/Datacom specifications

NOTIFICATION LETTER

CARANA
CORPORATION

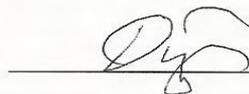


SAP

Registrational#: TIMS NL/SAP/CARANA -1 22/09/04

Project: TIMS	
Project Phase: Project Preparation	
Date: 22.09.2004	Time: 15:30
Place: MoF, Baku, Azerbaijan	
To: <ul style="list-style-type: none">• Ali Rammal, Chief Of Party, CARANA Corporation	
From: <ul style="list-style-type: none">• Dmitry Dymov, Project Manager, SAP C.I.S. & Baltic States	
Dear Mr. Rammal:	
<p>Please, accept this letter as acknowledgement that SAP fulfilled all necessary procedures with accordance to SAP worldwide practice to assist our customer, CARANA Corporation, and hardware provider, RISK Company, at specification the hardware and communications solution, which will be procured by the Ministry of Finance of Azerbaijan, under the World Bank loan.</p> <p>With accordance with the procedures mentioned above and accomplished by CARANA Corporation and RISK Company with SAP C.I.S & Baltic States assistance, the hardware, as specified in RISK, final and revised proposal on 21 September 2004, meets all customer requirements described in the Subcontract Agreement #729.1-SAP to satisfactory operate all SAP software components that will be used under our subcontract</p>	
Sincerely,	
TIMS SAP Project Manager Dimitry Dymov	

SAP C.I.S. & Baltic States:



/ Dmitry Dymov/

**Final Technical Specifications
Amendment # 1 to Technical Proposal**

This amendment is providing complete specifications of all hardware and system software. On acceptance, prior to contract signature, this amendment overrides previous technical proposal included in bid proposal documents.

IBM eServer pSeries 650-6M2 (two servers of identical configuration)

4x IBM Power4+ 1.45GHz 64-bit RISC Processors, up to 8
"SPECint_base2000" per processor = 909
8GB ECC DDR Chipkill SDRAM Memory, up 64GB
2x Dual-Channel U320 SCSI Adapter
4x 73GB 10K U320 SCSI Hot-Swap Drives, up to 584GB
Upgradeable to 4TB internal storage via D20 I/O Drawers
1x Active Backplane for 4 Hot-Swap disk drives
4x PCI-X 2GBIT FiberChannel Adapters
4x PCI-X Gigabit Ethernet Adapters
3x PCI 10/100 Ethernet Adapters, 4x Serial Ports
1x PCI Power GXT135 16MB Video Adapter
1x DVD-ROM Drive & 1x 1.44" FDD
13x PCI-X Slots (Blind/Hot Swappable), up to 56
2x Pairs (4x Total) Hot-Plug Power Supplies
IBM AIX 5.2 OS with unlimited client license
IBM HACMP 5.1 – Cluster Management Software with unlimited client license
IBM Tivoli Storage Manager Client & Server Software
IBM Network Authentication Server V1.1
IBM Certificate Authentication Services V5.1 & Crypto-Library 5.2
IBM Global Security 6.0 & IBM IP Security 5.2

LPAR (Logical Partitioning) System Configuration:

LPAR # 1 – Database

2x Processors, 4GB RAM
2x FC Adapters, 3x Ethernet Adapters
2x SCSI Adapters, 2x HDD's
Independent AIX 5.2 OS installed in partition

LPAR # 2 – Application

2x Processors, 4GB RAM
2x FC Adapters, 3x Ethernet Adapters
1x SCSI Adapter, 2x HDD's
Independent AIX 5.2 OS installed in partition

HMC (Hardware Management Console):

1x Installed Processor; 1x 20GB HDD & 256 MB RAM
1x I/O Board w/ 1x Ethernet & 2x Serial Ports + 2x HMC Cables
1x 21" Flat Screen Color Monitor, Keyboard & Mouse

IBM TotalStorage FASt-T600 Turbo (one storage server with two controllers)

1x T600 Chassis & 1x EXP700 Chassis
T600: Dual Redundant FC2/2GBIT Controllers
T600: 2x FC2/2GBIT Host Ports at each controller, 4x Ports total
T600: Dual Redundant Power Supplies & Cooling System
T600: 2x Serial & 2x Ethernet Management ports
EXP700: Dual Redundant FC2/2GBIT ESM Controllers
EXP700: 2x FC2/2GBIT Interconnect Ports at each ESM, 4x Ports total
EXP700: Dual Redundant Power Supplies & Cooling System
RAID 0, 1, 0+1, 3, 5, 0+5 Support
2GB Mirrored High-Performance Cache
Throughput performance >750MB/sec
2TB Installed Capacity
28x 73GB 15K RPM FC2/2GBIT Hot-Swap Drives
Upgradeable up to 28TB of Storage Capacity
IBM FAST Storage Manager – Advanced Storage Management/Configuration
IBM FlashCopy – Point-in-Time Copy Software
IBM RDAC/AIX Drivers Layer for Dynamic Load Balancing / Multipathing
IBM RDAC/AIX Drivers Layer for Continuous Data Access / Multipathing
Unlimited license for capacity expansion
IBM FC Attach Agent for AIX

IBM TotalStorage 3583-L18 Scalable Tape Library (one unit)

LVD SCSI Connectivity Upgradeable to FiberChannel via expansion module
2x LTO/Ultrium2 200/400GB Tape Drives, up to 6
20x LTO/Ultrium2 200/400GB Data Cartridges
2x LTO/Ultrium Cleaning Cartridges
IBM Tivoli Storage Manager – Automated Backup/Restore Software
8x IBM Tivoli TSM Client Agents for AIX
2x IBM Tivoli TSM Server Agents for AIX
IBM Tivoli DRM (Disaster Recovery Management Software)
Tivoli – TSM License for all p650 Servers

IBM TotalStorage H08 FC Switch (two FC switches of identical configuration)

8x 2GBIT FiberChannel Ports
32GBIT Backplane performance throughput
1U Rack-Mount Chassis

Testing Servers Specifications (two servers of identical configuration)

IBM eServer pSeries 650-6M2 (one unit)

4x IBM Power4+ 1.45GHz 64-bit RISC Processors
"SPECint_base2000" per processor = 909
8GB ECC DDR Chipkill SDRAM Memory, up 64GB
1x Dual-Channel U320 SCSI Adapter
3x Dual-Channel U320 RAID Adapters
4x 73GB 10K U320 SCSI Hot-Swap Drives
8x 73GB 10K U320 SCSI Hot-Swap Drives
Upgradeable to 3.5TB internal storage via D20 I/O Drawers
4x PCI-X Gigabit Ethernet Adapters
1x Active Backplane for 4 Hot-Swap disk drives
1x PCI 10/100 Ethernet Adapter, 3x Serial Ports
2x PCI Power GXT135 16MB Video Adapter
1x DVD-ROM Drive
14x PCI-X Slots (Hot Swappable) located on
IBM AIX 5.2 OS with unlimited client license
IBM Network Authentication Server V1.1
IBM Certificate Authentication Services V5.1 & Crypto-Library 5.2
IBM Global Security 6.0 & IBM IP Security 5.2
2x Active Backplanes for 6 Hot-Swap disk drives each, 12 Slots Total, CEC + 1x D20 Drawer

LPAR (Logical Partitioning) System Configuration:

LPAR # 1 – Testing Database

2x Processors, 4GB RAM
3x Ethernet Adapters
1x SCSI Adapter, 2x HDD's
1x RAID Adapter, 4x HDD's
Independent AIX 5.2 OS installed in partition

LPAR # 2 – Testing Application

2x Processors, 4GB RM
2x Ethernet Adapters
1xRAID Adapter, 2x HDD's
1x RAID Adapter, 4x HDD's
Independent AIX 5.2 OS installed in partition

HMC (Hardware Management Console):

1x Installed Processor; 1x 20GB HDD & 256 MB RAM
1x I/O Board w/ 1x Ethernet & 2x Serial Ports + 2x HMC Cables
1x 21" Flat Screen Color Monitor, Keyboard & Mouse

IBM T42 Enterprise Rack Cabinet (two units)

42U Height / 19" Industry Standard
2x Lockable Doors & 2x Sidepanels
4x 7-Plug IEC Power Distribution Units

IBM Console Management Solution (one unit)

1x Console Switch
1x 1U Tray w/ 15" TFT
Monitor, Keyboard & Pointing Device Cable Sets

CISCO Switch (one unit)

CISCO Catalyst 2950-24
2x Gigabit, RJ-45 Ports
24x 10/100, RJ-45 Ports

VSAT Terminal – Huges PES5000 (83 Units)

Frequency:

Range Ku-Band
Antenna: 1.2 m
RF Power: 1 Watt

Satellite Channels

RX: 512 Kbit/s (BPSK, QPSK)
TX: 64 Kbit/s, Kbit/s and 256 Kbit/s (MSK, OQPSK)

Ber Error Rate:

Maximum: 1x10E-7
Nominal: 1x10E-9

Ports (Interfaces)

Up to 4 Serial Ports (data)
1x Serial RS-232 (management)
1x LAN 10BaseT
1x Video (950-1700 MHz)
2x Phone (analogue, RJ-11) Type FXS or 1x 4-Wire E&M (for PBX)

Transmission speed and features:

Serial Port – Async up to 19.2 Kbit/s, Sync up to 64 Kbit/s
LAN-port: RX up to 400 Kbit/s, TX up to Kbit/s
Protocol Ethernet (10 Mbit/s) in bridging mode
IP Routing (RIP), PPP / SLIP

Supported Standards:

X.25, X.3/X.28 PAD, SDLC (PU4-PU2, PU4-PU4), SDLC to Token Ring
BSC 3270, TINET, HASP

Management Switch – DELL PowerConnect 3324 (1 unit)

22x 10/100 Autosensing Ethernet Ports
2x 10/100/1000 Gigabit Ethernet Ports w/ Fiber Optic Expansion
8.8GBIT Switching Capacity
VLAN, EtherChannel Support

Switch B – DELL PowerConnect 2016 (122 units)

16x 10/100 Autosensing Ethernet Ports
3.2GBIT Switching Capacity
2.4Mpps Forwarding Rate

Multiplexer - RAD OPTIMUX 4E1L / 4 E1 Channels (Two Units)

Multiplexes four E1 channels over single E2 link
E2 transmission over fiber optic cable
Range Up to 110 KM
Data Rate for each channel 2048Kbps
Data Rate for Main link 8448Kbps
Plug-and-play configuration, SNMP agent
Out-of-band management via V.24 supervisory port
E1 interface complies with ITU G.703, G.742, G.956, G.823

Main link diagnostics include loop-backs and BER test

Router CISCO 2691 (2 units)

Modular architecture – 3 x WAN Interface Cards slots, 2 x Onboard AIM (Internal) Slots, 1 x Network module slot

High-performance 240-MHz PMC-Sierra RM7061A RISC processor

System Memory (Default/Max) - 128MB/256MB

Flash Memory (Default/Max) - 32MB/128MB

1 x serial port (V.35 interface), 2 x onboard 10/100BaseTX Fast Ethernet ports

Operating system supports: standard protocols RIP v1, RIP v2, SNMP, TCP/IP, routing etc...

Software provides enhanced routing functionality on all interfaces, Security Device Manager (supplied with the device) provides simplified management of security features, encryption support, enhanced setup features with Context-sensitive questions that guide the user through the router configuration process, allowing faster deployment

Additional Modules: High Performance ATM AIM/E1 Bundle
AIM-ATM with 2x VWIC-2MFT-E1

Firewall CISCO PIX506 (1 unit)

Provides perimeter network security to prevent unauthorized network access, stateful inspection Firewalling, virtual private networking (VPN), intrusion protection

Processor: 300-MHz Intel Celeron Processor

Cleartext throughput: 20 Mbps

56-bit DES IPsec VPN throughput: 20 Mbps

Processor: 300-MHz Intel Celeron Processor

Random access memory: 32 MB of SDRAM

Console Port: RS-232 (RJ-45) 9600 baud

2 x Ethernet ports – Outside and inside, both integrated 10BaseT ports, auto-negotiate (half/full), RJ45

UPS for Cluster Servers (2 Units)

Two UPS'es for duplicated power sources with no single point of failure.

Inform Saver 15KVA

Input Voltage support: 170V-270V permanent & fluctuation

Input Frequency: 50Hz

RS-232 Management port & management software

10000W+ sustained load support (15KVA) minimum

Powerless operation, minimum half hour at 10,000W (15KVA) load

IPG – Independent Power Generator (83 Units)

Normal or unleaded gasoline

Fuel Tank Capacity: 6 lt

Fuel consumption: 2.7 lt/hour

Nominal voltage: 220v

Nominal Current: 29A

Power: 7,5 kVA

Workstation A - DELL OptiPlex 170L (393 Units)

OptiPlex 170L SMT - 2.8GHz Intel® Pentium® 4 Processor (512k
256MB DDR SDRAM
40GB UltraATA 7200RPM HDD
Integrated 10/100-Base-T Ethernet Adapter
1.44 MB / 3.5" FDD
64 MB Intel Extreme Video Adapter
PS2 Mouse
Cyrillic (Russian/English) Keyboard
50-Speed CD-ROM Drive
Preinstalled Microsoft Windows XP Professional
Preinstalled Microsoft Office 2003
Preinstalled Microsoft Internet Explorer 6.0
17" Flat Screen CRT Monitor
UPS INFORM (GUARD) 600VA, 180-240V/50Hz

Workstation B - DELL OptiPlex 170L (95 Units)

OptiPlex 170L SMT - 2.8GHz Intel® Pentium® 4 Processor (512k
256MB DDR SDRAM Memory
40GB UltraATA 7200RPM HDD
Integrated 10/100-Base-T Ethernet Adapter
1.44 MB / 3.5" FDD
64 MB Intel Extreme Video Adapter
PS2 Mouse
Cyrillic Keyboard
50-Speed CD-ROM Drive
CD-RW Drive (10X/40X/20X)
Preinstalled Microsoft Windows XP Professional
Preinstalled Microsoft Office 2003
Preinstalled Microsoft Internet Explorer 6.0
17" Flat Screen CRT Monitor
UPS INFORM (GUARD) 600VA, 180-240V/50Hz

Notebook – DELL Latitude D505 (10 Units)

Intel Pentium M 1.4GHz Processor, Centrino Technology
256MB 33MHz Memory (2x128MB)
30GB 4200RPM HDD
DVD/CD-RW Combo Drive
Integrated 10/100 Ethernet
Integrated 11Mbit Wireless Ethernet Adapter
Integrated V.92 Fax/Modem
15" TFT Screen
Carry Case, Cyrillic Keyboard

Printer A – IBM InfoPrint 1145N (7 Units)

A3/A4 Laser Printer
45ppm printing speed
Ethernet LAN Interface
64MB RAM, up to 384MB
1200x1200 dpi resolution @ 45ppm
250,000 pages/month duty cycle

Printer B – DELL Workgroup Laser 5200N (113 Units)

A4 Laser Printer
35ppm printing speed
Ethernet LAN Interface
64MB RAM, up to 320MB
1200x1200 dpi resolution @ 35ppm
175,000 pages/month duty cycle

Server - DELL PowerEdge 2850 (1 Unit)

2x 2.8GHz Xeon Processors
2GB ECC SDRAM
1x Perc4e/Di RAID Controller
4x 146GB 10K U320 Hot-Swap HDD's, up to 6
2x Power Supplies
2x Gigabit Ethernet Adapters
CD-ROM, FDD, Video Adapter
17" DELL CRT Color Monitor, Keyboard, Mouse
OS: Windows 2000 Advanced Server w/25 Client Licenses

C. Appendix 3. Glossary.

SW - Appendix A “Statement of Work” of contract 729.1-SAP.

SAP system is one or more R/3 instances working on the one or more servers and using one common DBMS and unique System Identification (SID).

R/3 System– OLTP system SAP R/3 for transactional processing.

BW System–OLAP system SAP Business Intelligent Warehouse for reporting processing.

TIMS – Treasure Information management system.

SAP Client is logically and organizationally independent unit within the System, which allows dividing rights of access to data.

Client logical name – client mnemonic name.

SAP Object is an element of the development environment: ABAP-program; table; screen or transaction.

Instance is a bundle of SAP R/3 working processes that are operating cooperatively on the one server and sharing common directory structure and database. All these processes have the unique System Identification (SAPSID or SID) and unique Instance Number.

Correction Transport System, CTS is an R/3 toolset designed for recording and documenting changes of data and objects within a system, as well as for transferring changed data and objects between systems.

System Landscape is a collection of R/3 systems united by CTS each fulfilling different tasks during SAP R/3 implementation project in the organization. It could comprise one, two, three or more R/3 systems designed for the development, configuring and live operation.

Customizing is a process of configuring R/3 system to meet the requirements of a specific organization (implementation of business functions and business processes). Customizing is done through the relevant system menus and transactions. Generally customizing affects Client-dependent data. Basically, customizing means changing the content of vocabulary objects (tables) and/or links between them.

Development is change of existing and/or creation of new system objects (repository objects or data dictionary objects).

Client Independent data are system objects one can refer to in all Clients. Such objects are ABAP-programs, data dictionary objects and some customizing tables.

Client Dependent data are system objects one can refer to in one Client only. E.g. master data, most configuration tables, transaction data and some development environment objects.

Customizing is a process of configuring (implementing business functions and business processes) the system for the needs of a specific company. Customizing is done through relevant IMG tree menus. This customizing process affects mostly Client-dependent data.

IMG – tool for maintenance of SAP system implementation.

Configuration is a package of data and links as a result of customization. Contains business processes and data customized to meet company’s specific needs.

Change Request, CR is a CTS R/3 tool used for change management in the System. Task is a Change Request element. There are two types of CR: SYST type CR and CUST type CR. The first are used for registering repository objects changes, e.g. ABAP-programs, and registering Client-independent data. The second are used for registering Client-dependent data. Further on, when type of request is not important anymore, term CR is used to denote all types of requests. Cases when type of request does matter are specially marked out.

Task, in relation to CTS, is a CR subobject that enables further request structuring. A Request could comprise several tasks linked to different users and storing information about changes of different Object groups.

Transport Request is a system tool used to transfer Change Requests from one system to another.

Master data - major data used by operational and transactional data.

CCCR (Client Copy per Change Request) Transfer is special technology for transferring objects and settings between Clients within one System. It is a means of transferring open CRs to other Clients. It is used mostly for transferring objects and settings to a separate Client for testing purposes.

Object Original System – R/3 system where the object was originally created. It is stored as an attribute of each object in the system. An Object Original System is defined by a three-symbol System ID (SID).

Copies are objects that do not belong to the Original System. When an object is transferred through CTS to another system, its attribute of the original System keeps its value by default. Objects, whose Original System attributes do not match SID of their resident system, are called copies.

Repair is an object change outside of the Original System, therefore a copy change. It could be done in special cases only as it could lead to the emergence of two development branches on a single object version tree. R/3 does not support parallel object modification with the consecutive convergence of development branches, as structured configuration management systems do. Therefore when a copy is changed, the object gets an additional attribute (Repair Bit) that prevents copying of that object through CTS. For example, it will not be possible without setting special command execution modes to transfer a new ABAP program version from the Development System (Program Original System) to Quality Assurance System, if that program was edited directly in the Quality Assurance System until the Repair Bit will have been reset. After the Repair Bit has been reset, the object could be copied through a transport, where the old version will not be saved.

System object – Object has SAP Original System.

Modification is a special type of Change, change of system object.

Bandwidth is amount of data that can be transferred for a set period of time.

Latency time is time required to transfer minimum-length data packets from client to server and back.

Channel stability is percentage of time of channel availability vs. total testing time.

Regulations are aggregated rules and regulations that define work procedures for officials, authorities, institutions and organizations.

Role is a logic notion representing a user within the system, with the corresponding authorization, areas of responsibility and authority.

Technical support group – organizational structure of TIMS Project Office includes employees are responsible to maintenance of Project technical infrastructure.