

1 CENTRAL SERVER CLUSTER

The proposed new hardware should comprises a dual-redundant pair of Servers and a dual-redundant pair of Storage Arrays.

1.1 Server requirements

Processor	Dual processor, Intel E5-2600v3 series, x86 – 64 bit; PCIe 3.0,
Memory	Minimum 128 GB RDIMM DDR4, with possibility to extend to 768 GB; 24 slot
Hard Disc	Possibility to install up to 18 HD (Hot Swap) SAS/SATA/SSD, 2,5 “
PCI Slots	min. 6 PCI;
Networking	4x 1GbE
Interfaces	VGA, Serial, 6 USB 3.0, micro SD, RJ45
Graphic Card	Integrated
Operational System and Virtualization	Microsoft Windows Server (min. V. 2012); Red Hat Enterprise Linux SUSE Linux Enterprise Server Citrix Xen Server Rack 2U

1.2 Storage Array

The currently Storage Array, which is in operation now, shall be replaced by a dual redundant pair of Mass Storage Arrays. Each Storage Array should be connected to both of the servers.

The solution shall designed to be easy to deploy, to be secure, along with low management costs, while driving rapid return on investment through efficient storage consolidation.

The Storage Unit shall comply to the following requirements:

- Housing Type: Rack
- Rack Units: 2 U
- RAID Level: 0, 1, 3, 5, 6, 10, 50
- Connection: 8x SAS External SFF8088
- Power Supply: 2x Redundant
- Controller: Redundant (2x) P2000 G3 SAS MSA controller
- Housing: 24 drive bays
- Hard disks: 5x HP 300GB 6G SAS 10K 2.5in DP ENT HDD

1.3 Storage and Backup

A third server should act as a central system monitoring and backup server.

Data from the operational system servers will be backed up to the file system located at the Monitoring and Backup Server

Data from the operational system servers shall be backed up to the file system located at the Monitoring and Back-Up Server. Additionally it would be possible to transfer backup data to an external media in order to move backup data to a strong room or any other secured location.

1.3.1 Monitoring & Back-Up Server

A single server shall be provided to run the back-up software. For logistic commonality this is the same make and model as used for the application servers, although slightly differently equipped. The main differences are:

- Hard Disks: 1TB 6G SATA 7.2k SFF SC MDL Hot-Plug
- Interface Card: 1 x 1 Host Bus Adapter 6 GBit/s

1.3.2 Tape Library

For external media data back-up a Tape Library shall be provided.

Twenty cartridges and a cleaning cartridge should be supplied.

1.4 LAN Switch

The existing HP ProCurve 2848 Switches shall be replaced by a dual redundant pair of Cisco Switches, providing 10/100/1000-Gbps RJ45 downlink ports and up to 10 Gigabit Ethernet SFP and SFP+ on all the four uplinks.

1.5 WAN - IPv4/IPv6 Router

A dual redundant pair of Cisco Security Bundle shall be provided as Wide Area Network Routers.

The key characteristics shall be:

- Device Type Router
- Enclosure Type Rack-mountable - modular - 2U
- Connectivity Technology Wired
- Data Link Protocol Ethernet, Fast Ethernet, Gigabit Ethernet
- Network / Transport Protocol IPSec
- Routing Protocol OSPF, IS-IS, BGP, EIGRP, DVMRP, PIM-SM, IGMPv3, GRE, PIM-SSM, static IPv4 routing, static IPv6 routing
- Remote Management Protocol SNMP, RMON
- Encryption Algorithm SSL

- Features Firewall protection, hardware encryption, VPN support, MPLS support, Syslog support, content filtering, IPv6 support, Class-Based Weighted Fair Queuing (CBWFQ), Weighted Random Early Detection (WRED), Dynamic Multipoint VPN (DMVPN)
- RAM 512 MB (installed) / 2 GB (max)
- Flash Memory 256 MB (installed) / 8 GB (max)
- Status Indicators Link activity, power

1.6 Asynchronous Serial Interfaces / Terminal Servers

The 10 Asynchronous Serial Interfaces shall be provided by redundant pairs of Terminal Servers. The Terminal Server outputs shall feed through dual port A/B interface switches and then dual port modem interface cards.

The Terminal servers shall allow transmission at speeds from 134 bps to 230.4 Kbps. It should be possible to add further additional asynchronous ports can be added either by adding additional units or using models with a different number of ports.

Parameterization and monitoring shall be done through CLI or centrally by an easy to use web-based GUI interface, and/or a built in SNMP manager, ASCII code should be supported, Baud rates from 134 bps to 230,4 kbps, bit length, parity, flowcontrol XON/XOFF or DTR, parity, number of stopbits should be configured per channel

1.7 Switching System

A Switching system shall provide individual A/B switching of incoming lines. If one MRV terminal server fails the asynchronous AFTN interface will be automatically switched to the remaining terminal server and thus the A/B switching systems in combination with redundant pairs of terminal servers provide continuous access from asynchronous interface to ATS services.

The ports shall be provided in dual-redundant configuration.

Each chassis shall accommodate one Power Supply/Control Card and up to 16 Switching Interface Cards with up to 32 switching channels.

The Switching Interface Cards shall be transparent to all communication formats and speeds.

1.8 Server Rack

The server and other central hardware shall be mounted in a 19" / 42U cabinet Rack with front and rear doors and side panels.

A local system position, KVM Console, shall be integrated into the rack enabling local control / configuration of the servers.

The TFT KVM Console shall provide the GUI for the operator. It should have a full 17.3 inch WXGA+ monitor and keyboard with touch pad in a 1U format.

The TFT KVM Console shall provide a three button touch pad, 4 scroll keys, and Windows shortcut keys and should provide PS2 and USB.

1.9 Working Positions

The four Working Positions shall be equipped with workplace computers, which are configured as follows:

- Processor Type: Intel® Core™ i5-4590S
- Processor Speed: 3,2 GHz Quad Core
- Motherboard Chipset: Intel Q75 Express
- Main Memory: 8GB 1333 MHz DDR3 SDRAM
- Memory Banks (occupied/total): 1/4
- Hard Drive: 500 GB 7200 U/min SATA 3,0 Gb/s
- Optical Drive: DVD-Recorder
- Additional Drive: 22-in-1 Card Reader
- Graphics Card: On Board
- Audio Card: Integrated High Definition audio
- Network Card: Ethernet 10/100/1000 Mbps
- Housing Type: Micro Tower

Interfaces/Ports

- USB: 4 x USB 3.0 and 6 x USB 2.0
- Serial: 1 standard with 2nd optional
- Parallel: 1 optional
- PS/2: 1 keyboard, 1 mouse
- Video: analog for integrated graphics, DVI output via HP DisplayPort to DVI-D Adapter
- Support for Multi-Monitor: 1 Standard DisplayPort and 1 Standard VGA
- Audio: microphone and headphone (front), input and line out (rear)
- NIC 1 (RJ-45): Integrated Intel 82579LM Gigabit Ethernet
- Slots: 1x PCI, 2 x PCIe x1, 1 x PCI x16

The workstations are equipped with an additional network interface card (allowing them to be connected to both sides of the dual-redundant LAN).

Four Monitors 32-inch TFT Monitor Ultra HD, internal audio, for the workstations shall be provided.

2 TEST SYSTEM

The Test System shall be mounted in a separate Rack, which is the same make and model as the operational System.

The test server and Mass Storage Arrays layout shall be equal as the operational server cluster except for the conceptual redundancy.

A separate monitoring & back-up server and a tape drive should be provided for the Test System.

The LAN Switch, the WAN Router of the test system should be the same model as used in the operational system

2.1 LAN Switch - Test

One switch, the same make and model as used in the operational system will act as switch of the test system.

2.2 WAN- IPv4/IPv6 Router - Test

One router, the same make and model as used in the operational system will act as router of the test system.

2.3 Serial Interfaces - Test

The Serial Interfaces of the test system comprise of:

- One LX-4032T-001AC MRV InReach Terminal Server.

2.4 Working Position - Test

One Working Position Station, in the same configuration as proposed for the operational system, shall act as Monitoring and Control Position of the test system. The working position shall be equipped with a 32" Ultra HD Monitor with integrated audio.

2.5 Mobile Administration Station

One Mobile Administration Station 15,6" Intel Core i7, 16GB RAM, 500GB SSD shall be provided.

3 ACTIVITIES ON-SITE

The installation of the Hardware at the PANSA should be provided. The Hardware elements and Cables should be clearly labelled and described. All installation should be done by experienced technicians. All necessary tools and materials should be provided.

The verification and validation tests should be done to proof that the delivered Hardware is safe to use and meets the contractual specification.

4 MAINTENANCE SUPPORT 24/7/36 MONTH

A three year 24/7 proactive support for the whole equipment should be provided with following parameters:

- Remote problem diagnosis and support
- Onsite hardware support
- Parts and materials
- 4-hour response time
- 24-hour “call to repair” time commitment.