DragonWave

DragonView

Network Management Solution

Version 2, Dec 2012

BUILDING BETTER BACKHAUL
EVERYWHERE

History

Version 1 as of Sept 26, 2012

- First issue

Version 2 as of Dec 14, 2012

- Screen dump updates

Preliminary note

- This slide set aims to present the complete DragonView NMS features-set, including available ones and planned ones
- As a general rules, features are mentioned as being already planned or for future releases
- Details about release-specific content and dates can be found in the roadmap and the Features List documents

Product highlights

Software architecture

Management functionalities overview (FCAPS)

E2E network management

Northbound interfaces and integrations

Hardware architecture and capability

Upgrade strategy

Details about NE-specific management capability

Summary

DragonView – Solution Description

- Centralized network management for Microwave products
- Full set of FCAPS functionalities for all the managed network elements
- E2E Ethernet services provisioning and monitoring management

- Flexible and scalable hardware and architecture
- Standard real time and batch northbound interfaces available for integration into any 3rd party OSS systems

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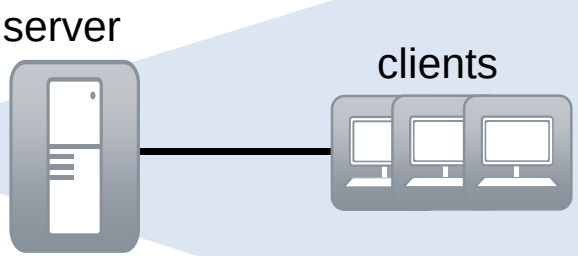
Summary

DragonView - Scalable and Flexible

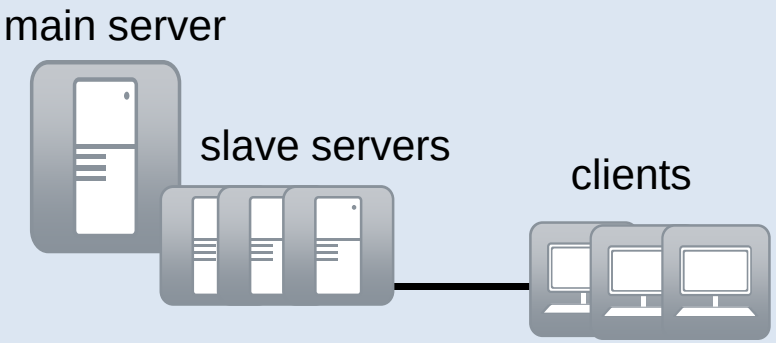
From small to large networks

Single Server



- 3200 NEeq*
- Up to 20 clients

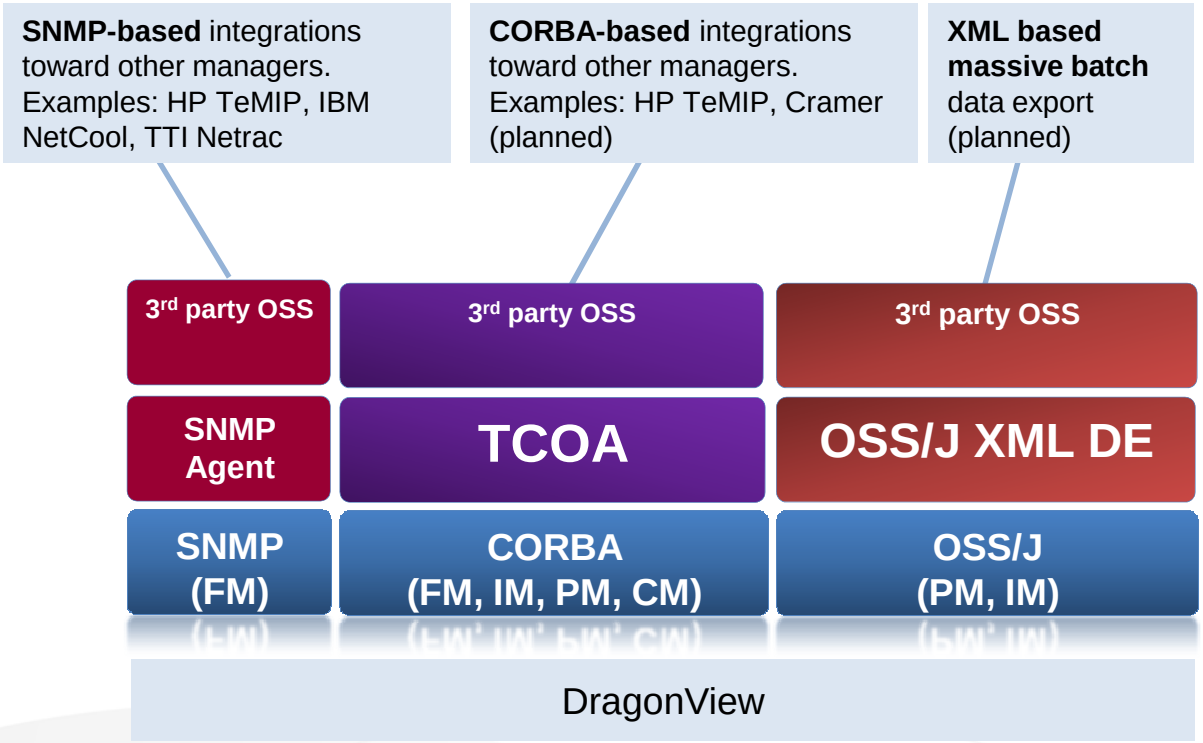
Multiple Servers



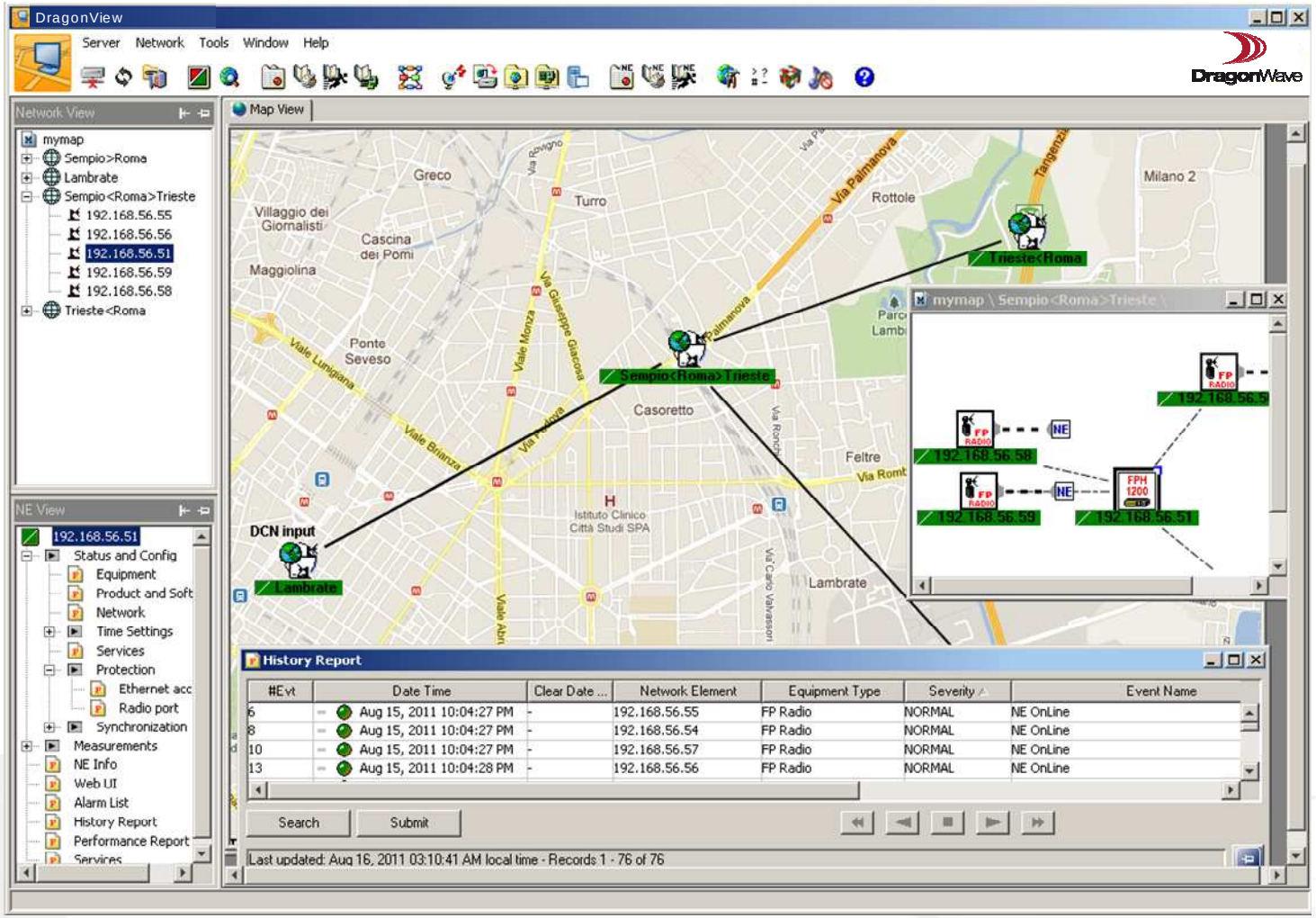
- Up to 20000+ NEeq*
- Up to 20 clients
- Up to 10 slave servers

* Network Element equivalent
(i.e. computacionally weighted NEs)

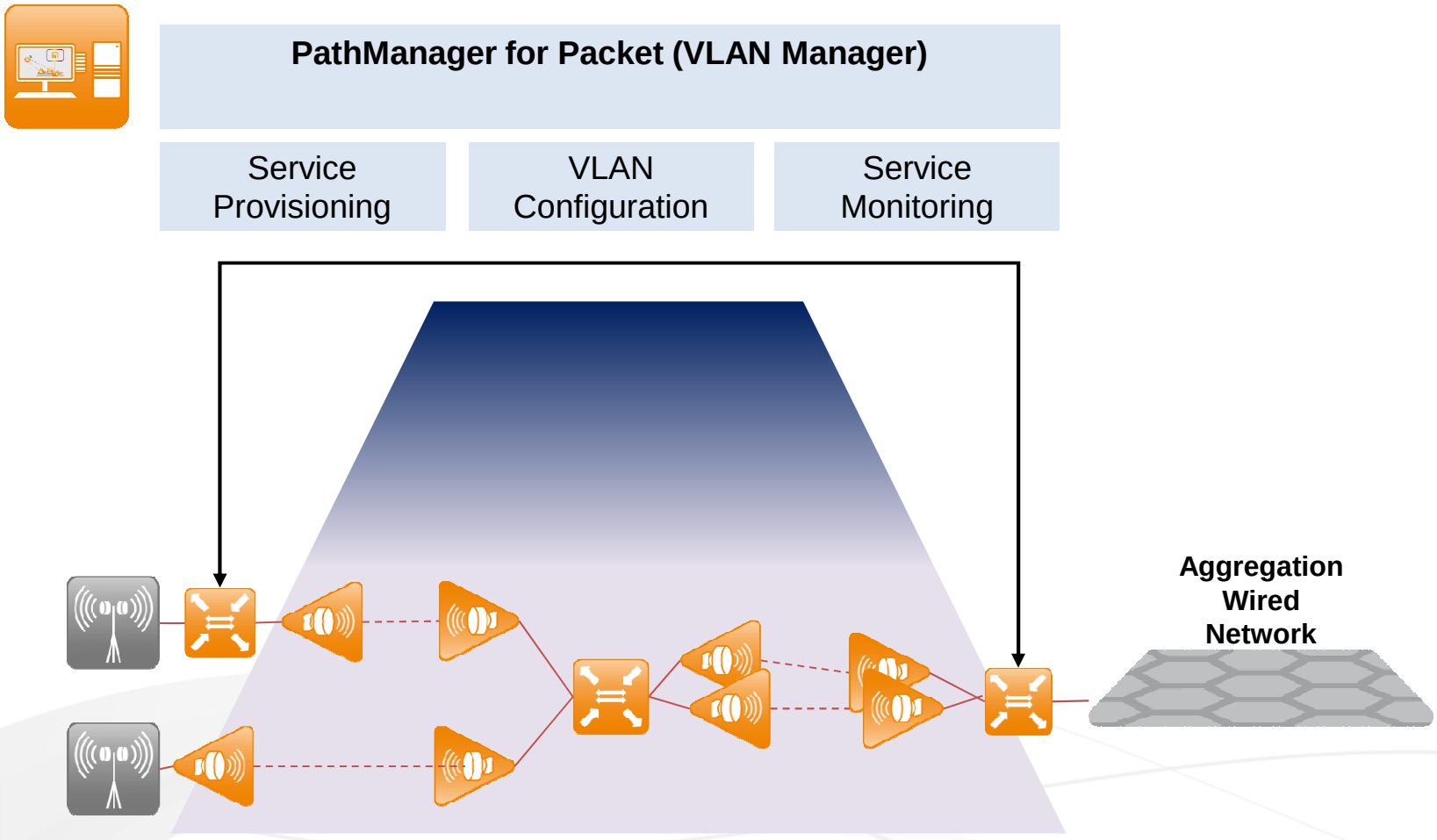
DragonView Northbound Interfaces



Graphical User Interface



E2E Ethernet Service Management



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Management Functions (FCAPS)

Security Management

Access control
Domain concept
Access rights
User classes

Performance Management

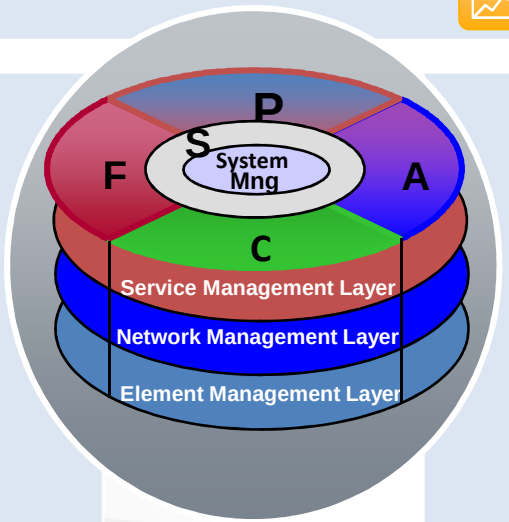
Performance monitoring
Performance reporting

Accounting Management

User history log

Fault Management

Alarm reporting
Alarm localization in map
Alarm logging
Alarm acknowledgement



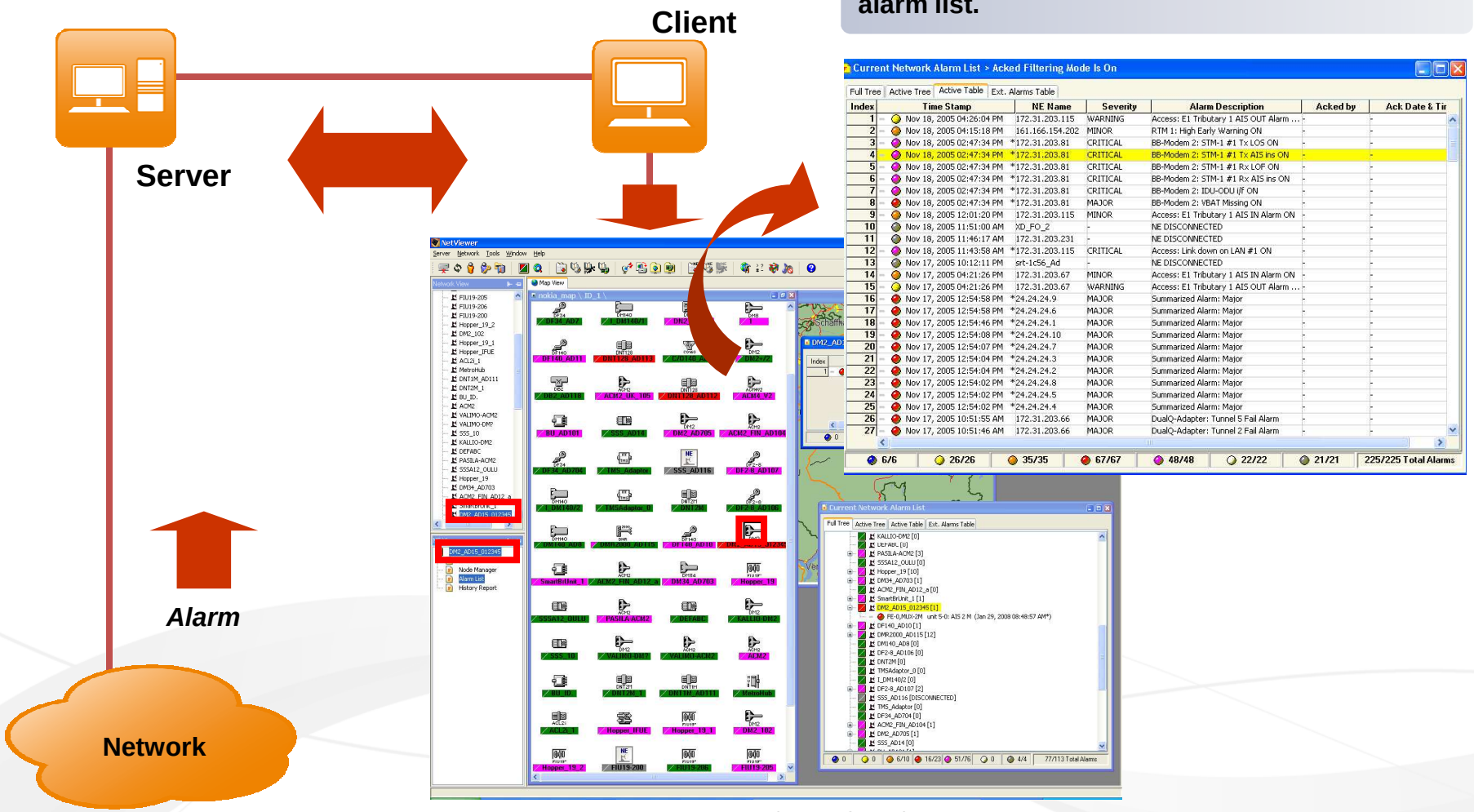
Configuration Management

Network configuration
Path provisioning
Software download
MW Radio configuration

Fault Management (I)

Current alarm List

DragonView client provides network current alarm list.



Fault Management (II)

Alarm list

Current alarm list supplies immediate view of active alarms present in the network.

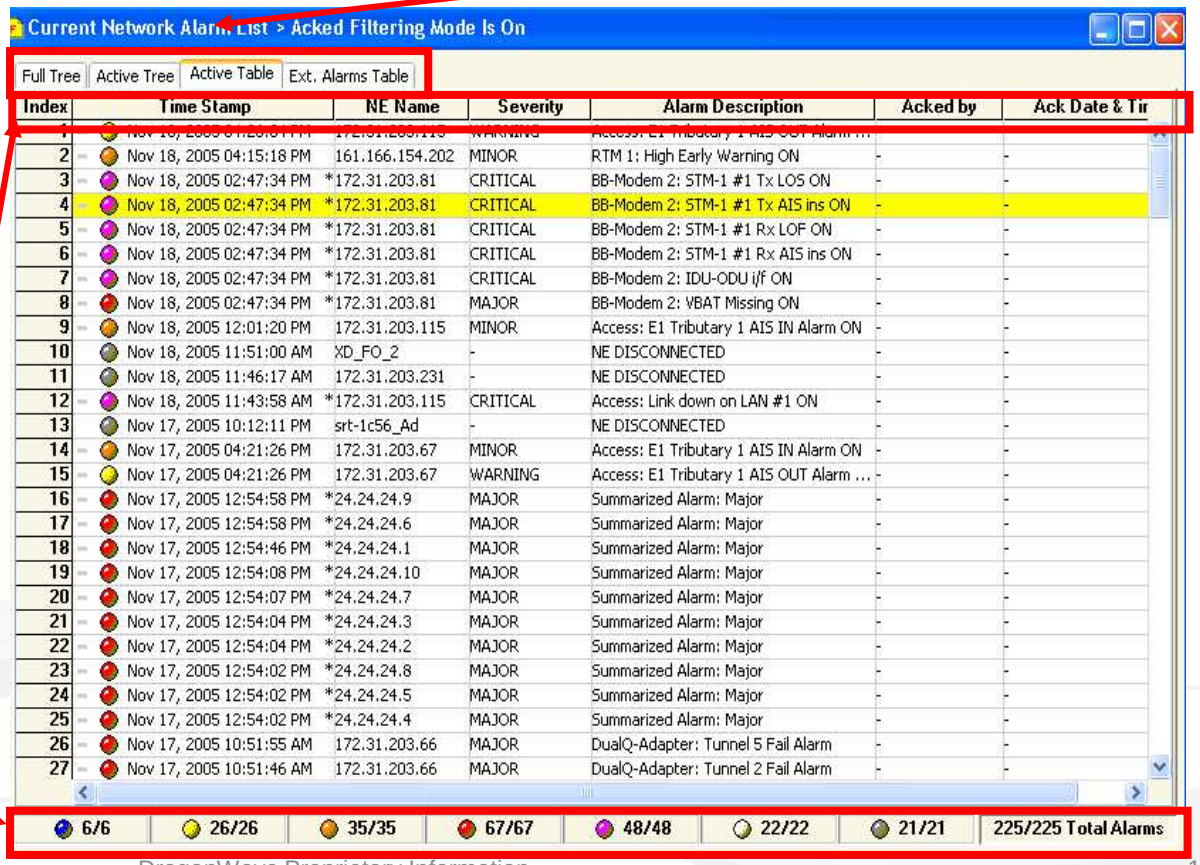
The results of the active alarm status can be performed in three ways:

- Full tree
- Active table
- Active tree
- External alarm table

Active table format
For each active alarm :

- Alarm index
- Time stamp
- NE name
- Severity
- Description
- Acknowledgement user
- Acknowledgement date

- Active alarms summary for each severity value
- Unacknowledged alarms
- Total alarms



Performance Management (I)

Support of Standard Measurements data:

- ITU-T G.821, G.826
- ETSI EN 301129 (RSPI, RPS).
- ACM (Adaptive Coded Modulation)
- Ethernet counters statistics per each interface
- Ethernet service statistics for E-Line and Pseudo-wires

Measurement data storage into central database

Graphical chart representation

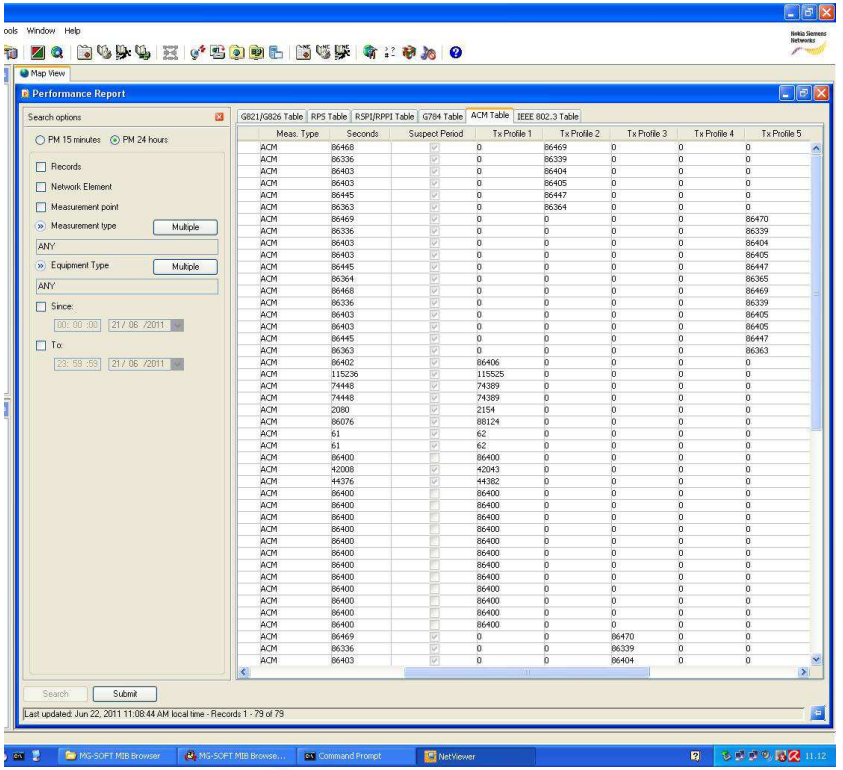
- Received RF power
- Ethernet counters

Performance measure reporting

Measurement data exporting through OSS/J XML open interface (opt. functionality)

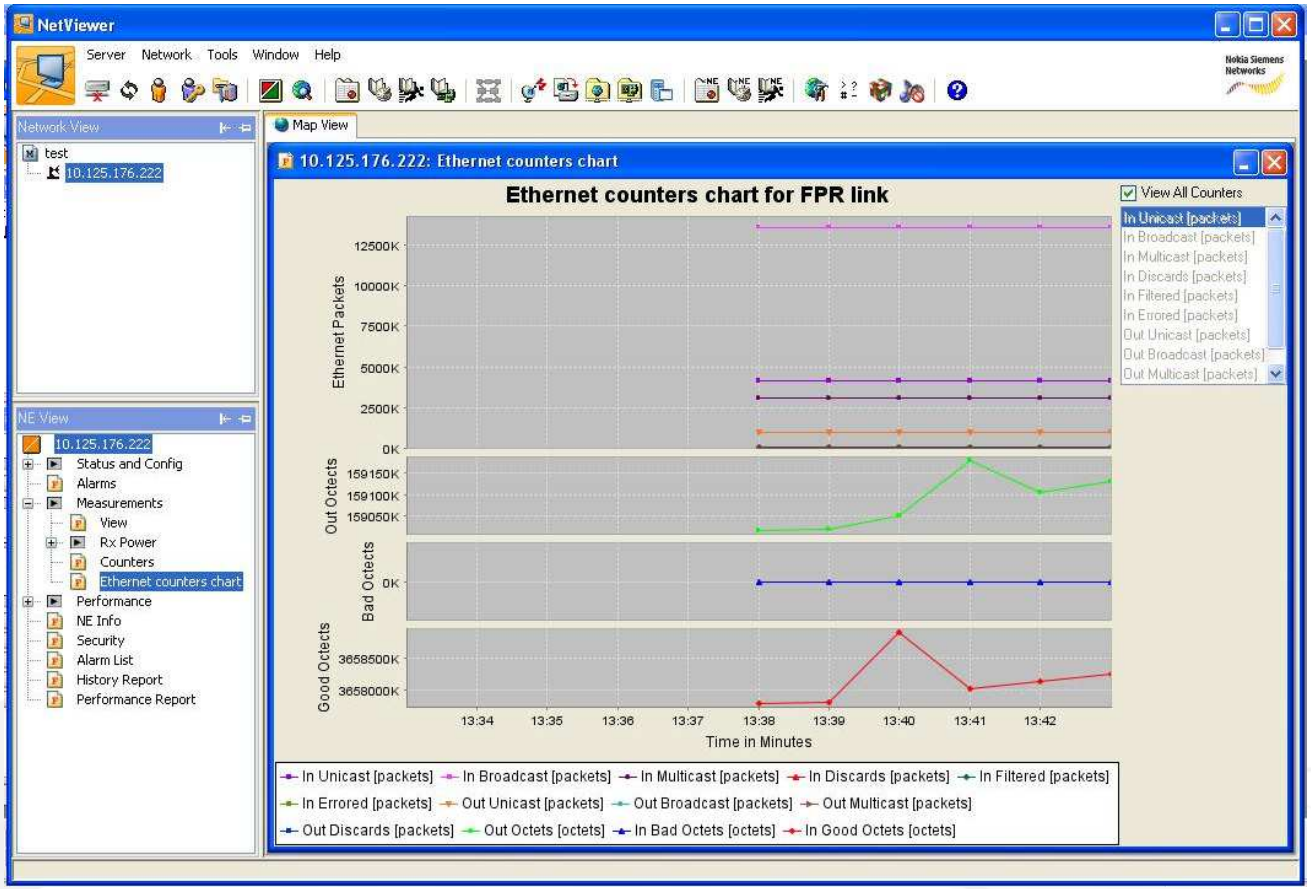
Performance Management (II)

- Performance data are accessible via report applications
- Standard 15min or 24h measurement periods reports
- Filtering criteria for measurement type, NE family, interval period
- Export of performance Logs
  Manual export/print
  Export format: txt, csv



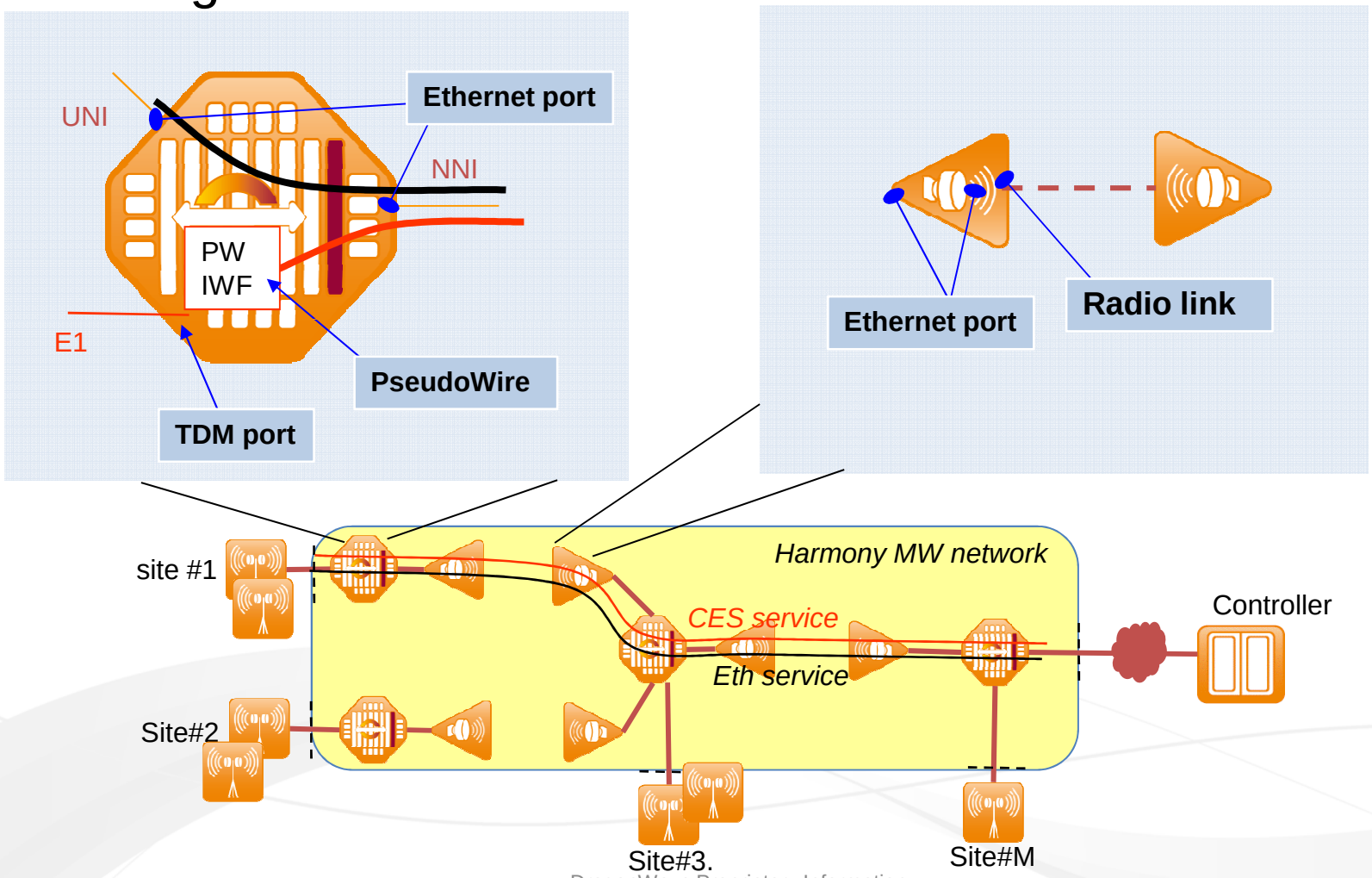
Performance Management (III)

Graphical representation of Ethernet counters for Harmony and Horizon product families



Harmony PM Data Collection (I)

Monitoring Points



Harmony PM Data Collection (II)

TDM ports (G.826 PDH/SDH)

Harmony FirstMile 200, Harmony Hub 800

- Massive collection network wise
- Via XML file over FTP
- Retrieval interval 15min and 24h data

DragonView functionalities

- Counters stored in DragonView server database
- Export available via northbound interface XML DE compliant to 3GPP format

G.826 Counters
Errored Seconds
Severely Errored Seconds
Unavailability Seconds

Harmony PM Data Collection (III)

Ethernet counters per port - IEEE802.3

Harmony FirstMile 200

Harmony Hub 800

Harmony Hub 800 Hybrid

Harmony Radio

Harmony Radio Hybrid

- Massive collection network wise
- Via XML file over FTP
- Retrieval interval 15min and 24h data

RMON Counters
InDroppedPkts
InGoodPkts
InPackets
OutDroppedPkts
OutGoodPkts
OutPackets

DragonView functionalities

- Graphical chart for real time running data
- Counters stored in DragonView server database

Harmony PM Data Collection (III)

Ethernet counters per port - IEEE802.3 (con'd)

Harmony Radio

- Massive collection network wise
- Via XML file over FTP
- Retrieval interval 15min and 24h data

DragonView functionalities

- Graphical chart for real time running data
- Counters stored in DragonView server database

RMON Counters
InDroppedPkts
InGoodPkts
InPackets
OutDroppedPkts
OutGoodPkts
OutPackets

Harmony PM Data Collection (IV)

RSPI and ACM

Harmony Radio

Harmony MultiRadio

- Massive collection network wise
- Via XML file over FTP
- Retrieval interval 15min and 24h data

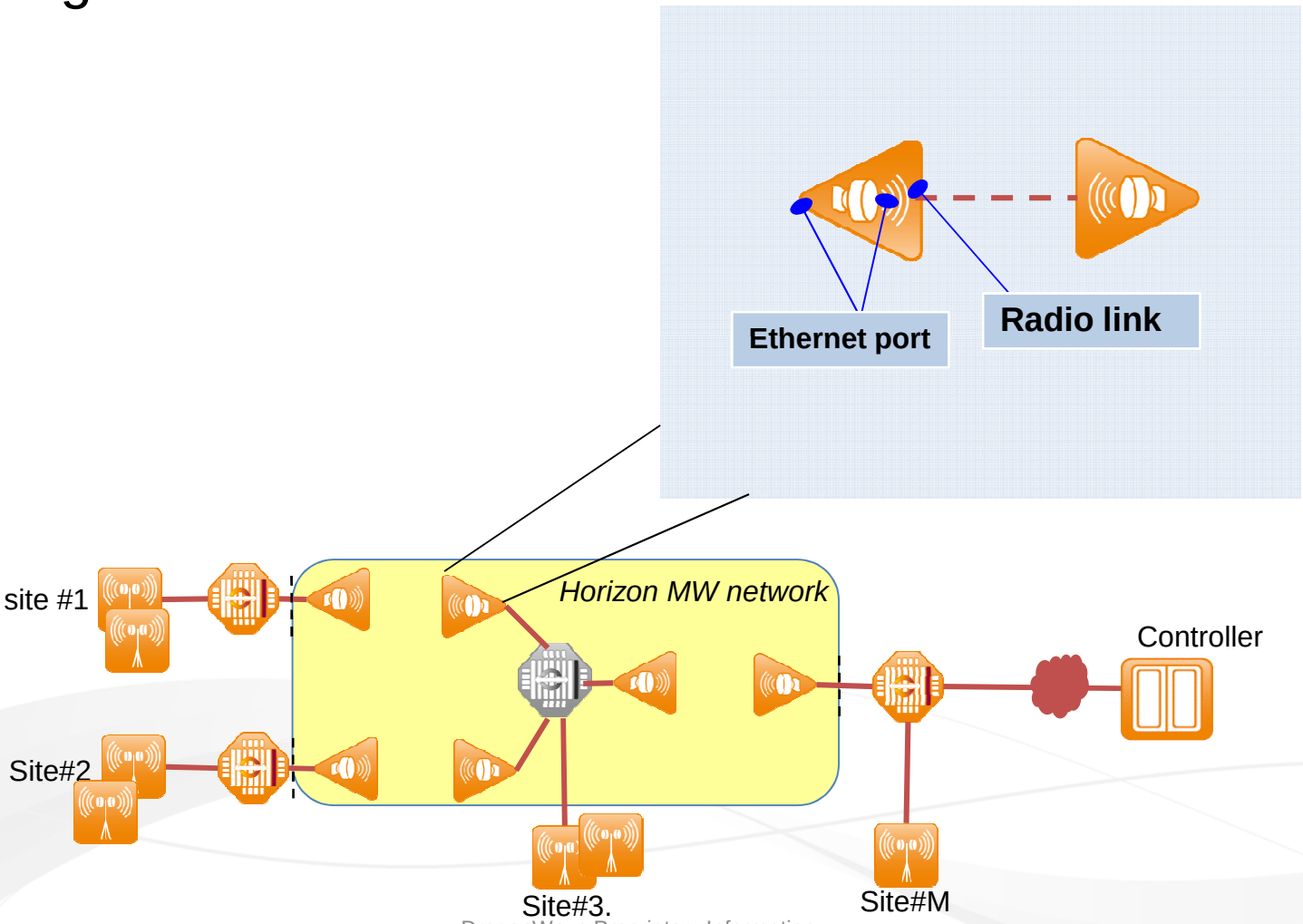
RSPI/ACM
ETSI RSPI
ACM secs per profile

DragonView functionalities

- Counters stored in DragonView server database
- Export available via northbound interface

Horizon PM Data Collection (I)

Monitoring Points



Horizon PM Data Collection (I)

Ethernet counters per port - IEEE802.3

Horizon Compact Plus

- Massive collection network wise
- Granularity interval 15min and 24h data

DragonView functionalities

- Graphical chart for real time running data
- Counters stored in DragonView server database

RMON Counters
InDroppedPkts
InGoodPkts
InOutOctets

Horizon PM Data Collection (II)

Ethernet counters per port - IEEE802.3

Horizon Quantum

- Massive collection network wise
- Granularity interval 15min and 24h data

DragonView functionalities

- Graphical chart for real time running data
- Counters stored in DragonView server database

RMON Counters
InDroppedPkts
InGoodPkts
InOctects
OutDroppedPkts
OutGoodPkts
OutOctets

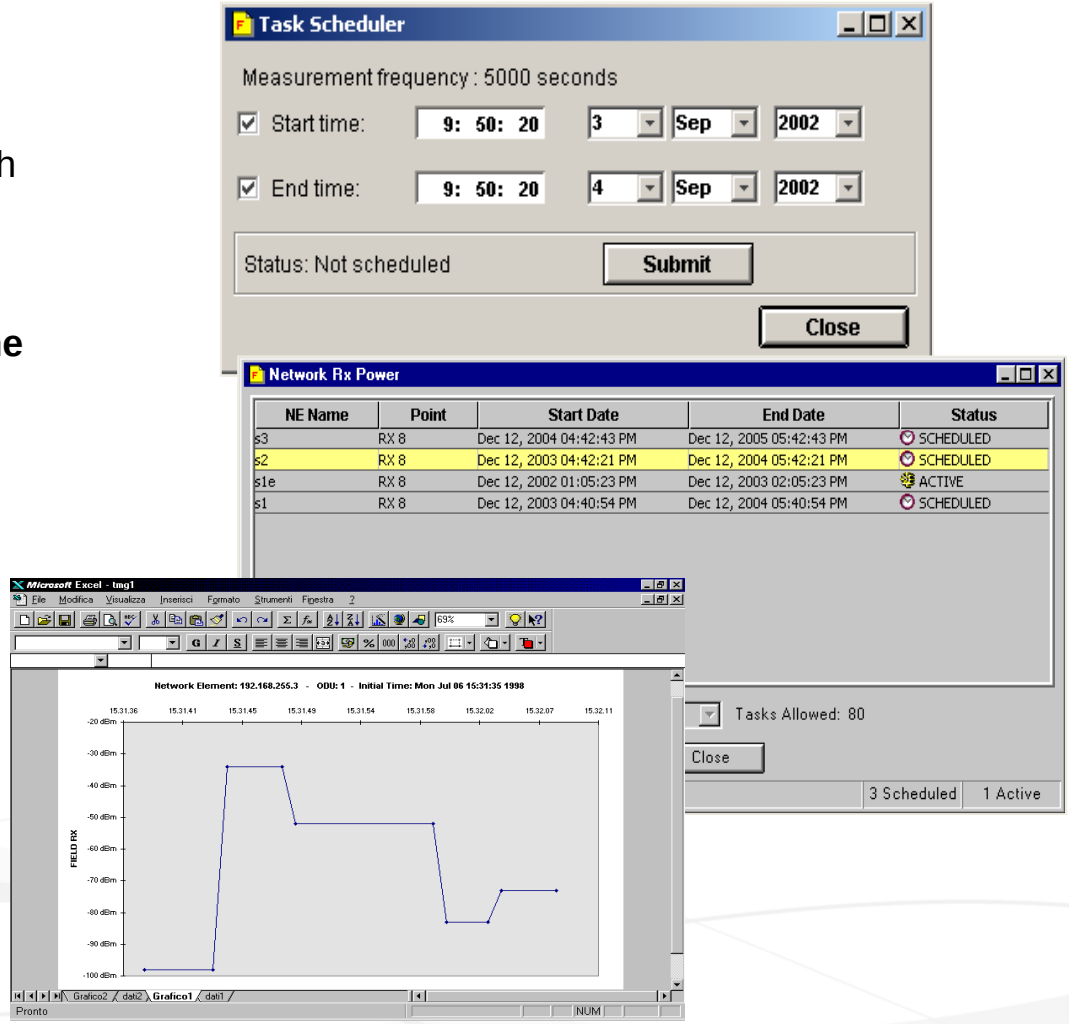
RF Power Scheduled Measurements

RF Power signal real time collection

- Up to 80 Received RF Power measurement can be scheduled through a scheduler

All Active measurements are shown in the network Rx Power window

All measurements are reported into the Database and graphically presented as chart



Configuration Management

NMS configuration:

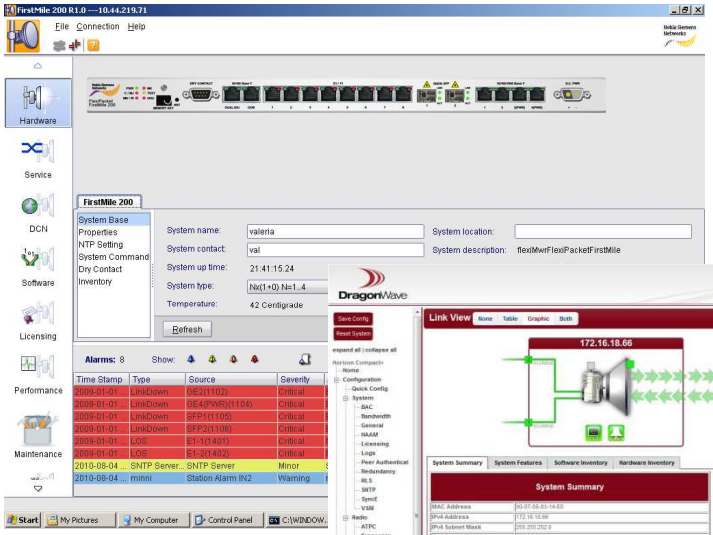
- Network map administration:
  - NE discovery and links discovery
  - NE description and comments
  - Import/Export lists of NE's
- Users management
- Database Configuration

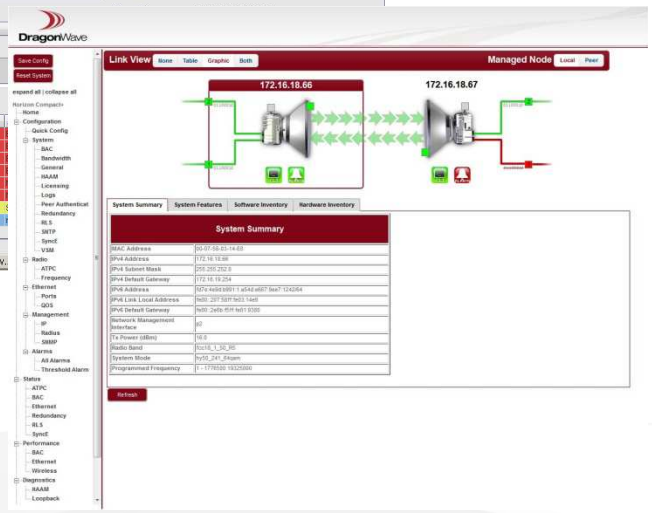
Network element configuration

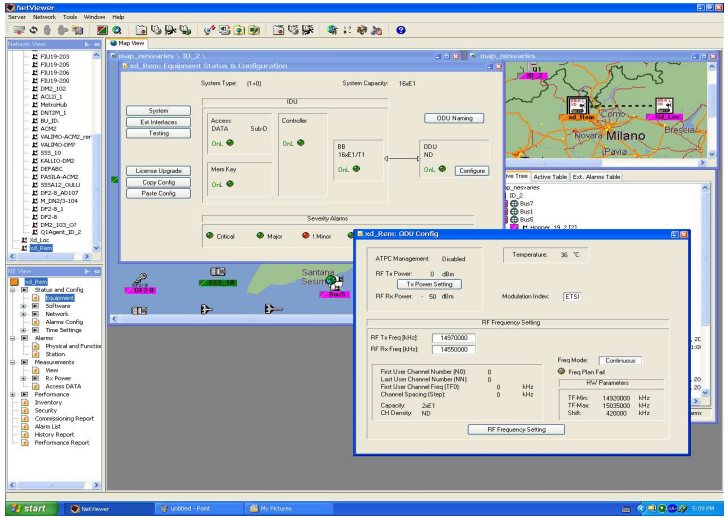
- Through specific DragonView NE plug-in or
- Via remote launch of NE WebCT

Configuration Management

Network Element management







Same network element local management interface and functionalities management

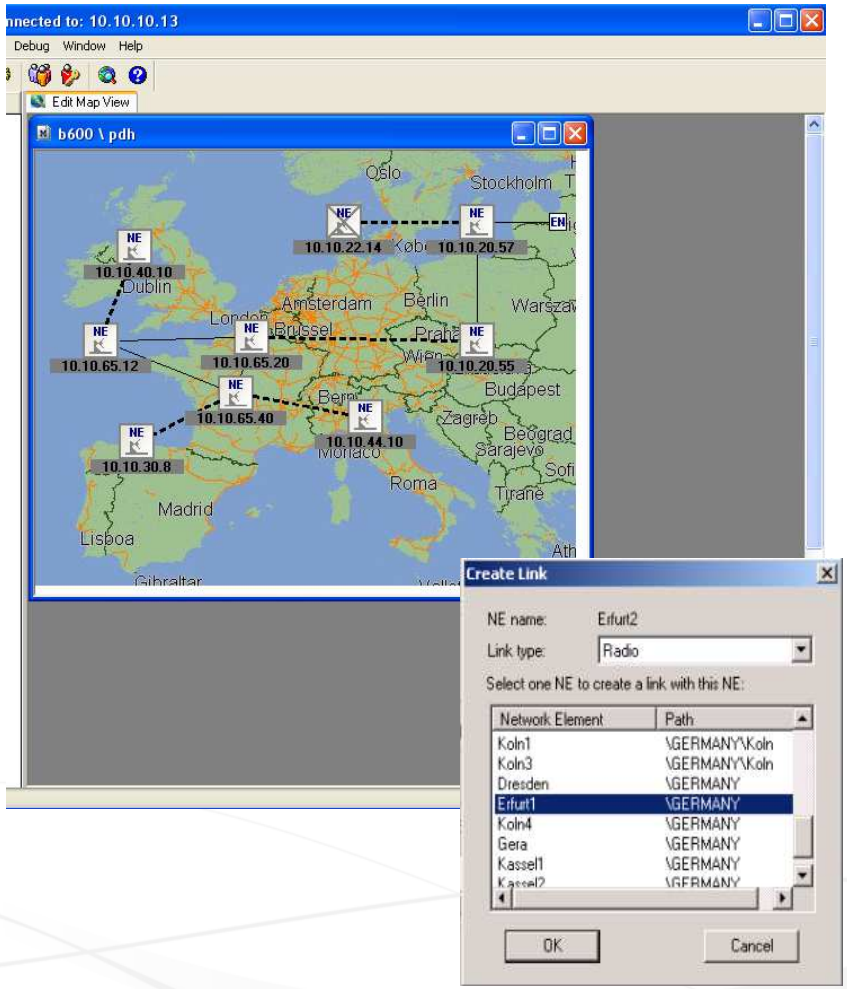
Configuration Management

Automatic procedures are available to speed up with the map creation:

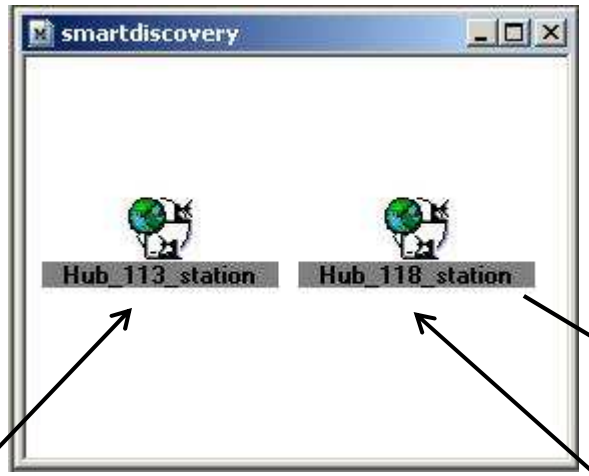
- NE Auto discovery
- Harmony station auto discovery
- Harmony radio link auto discovery

Topological links can be manually created:

- Ethernet cable link
- Tributary cable link
- E1/STM-1 cable link
- Microwave link

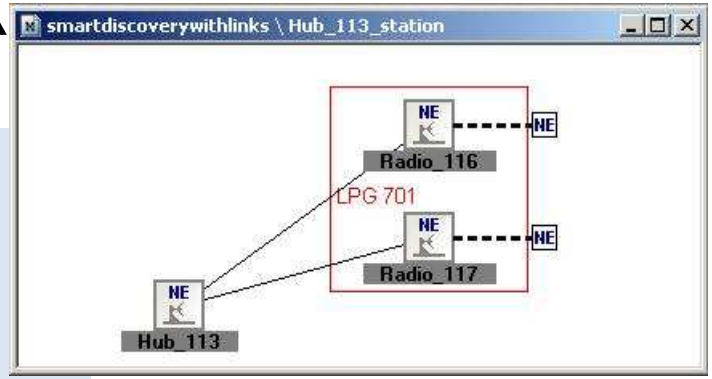


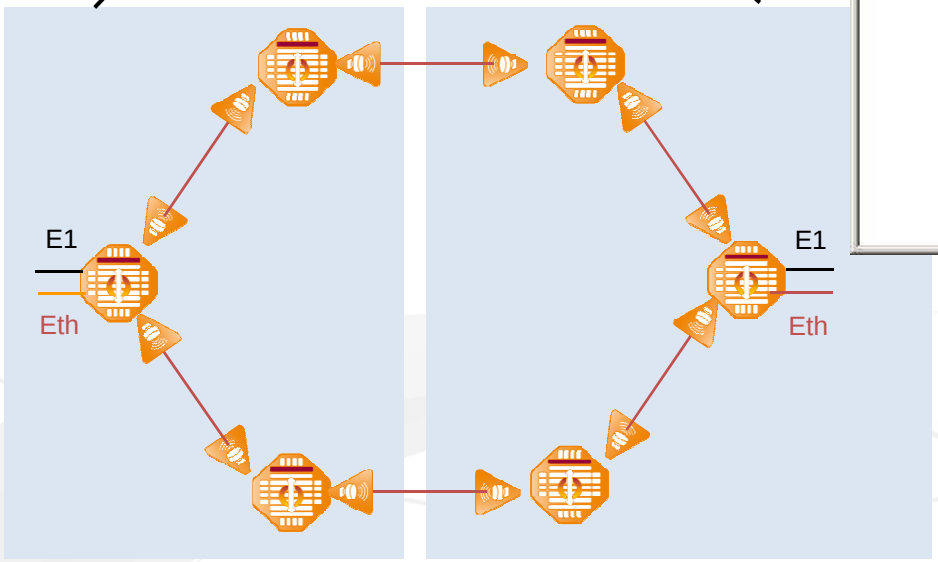
Harmony Station: Automatic Discovery



Harmony station are automatically discovered into DragonView Sub-map

- Automatic creation of topology link
- Topology map ready for PathManager for Packet
- Easy understanding of network

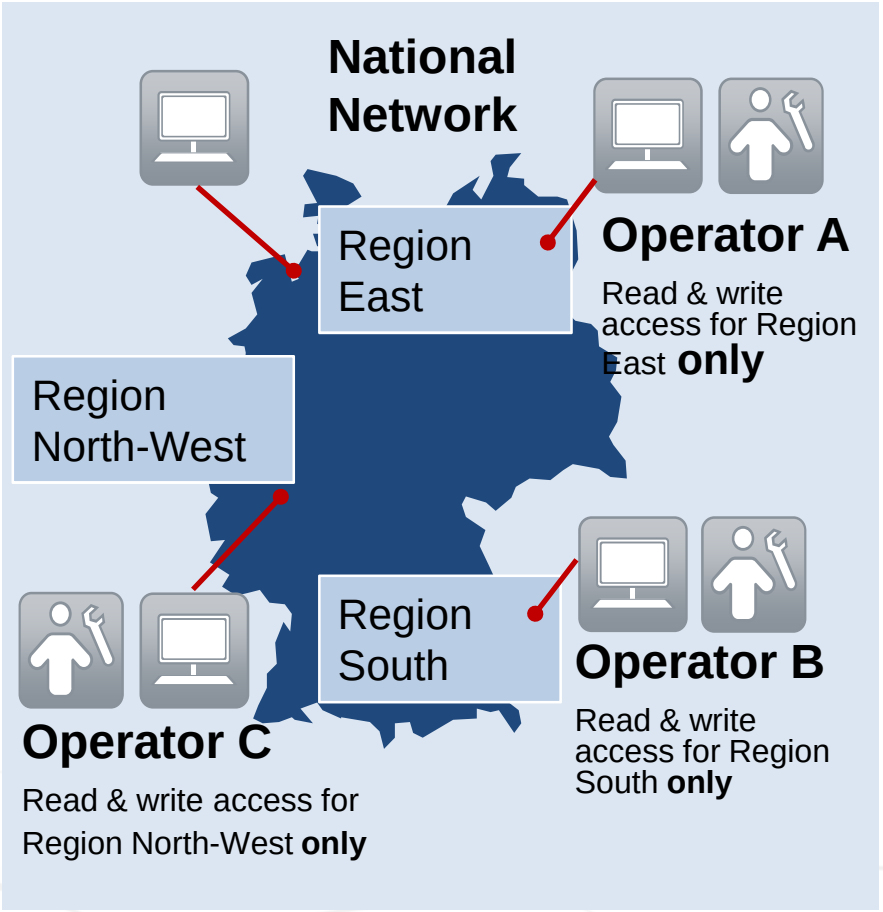




Sub-domain Management

Central Operation Center:

- Complete network supervision
- Full access to complete (sub) networks



Database Configuration

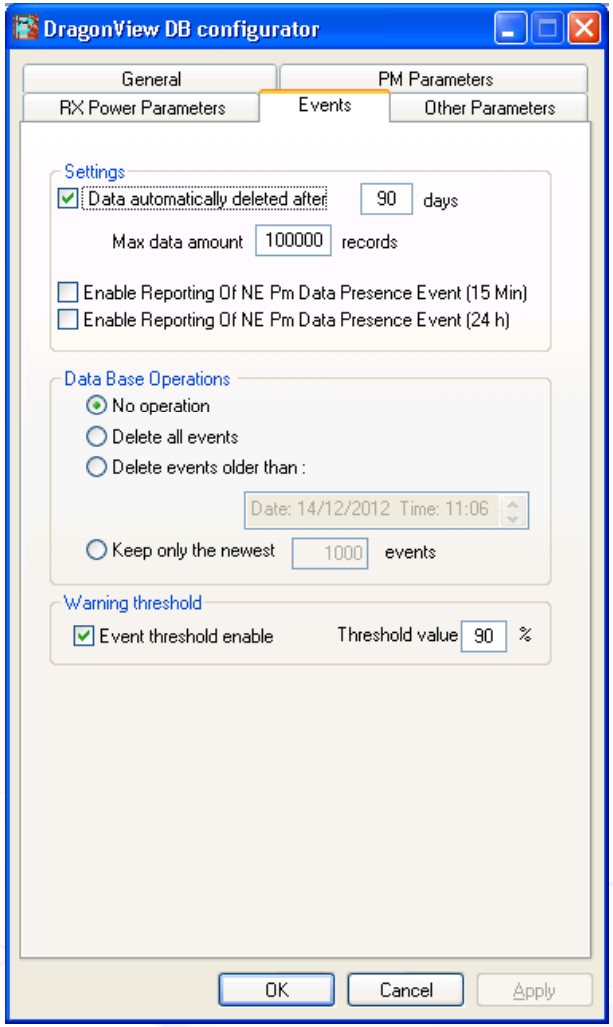
Database parameters are configurable for:

- Max data amount storable
- Up to 800000 records
- Data deleted automatically after N days
- Ageing mechanism
- Enable event threshold

Database Configuration

Database parameters are configurable for:

- Max data amount storable
- Up to 800000 records
- Data deleted automatically after N days
- Ageing mechanism
- Enable event threshold

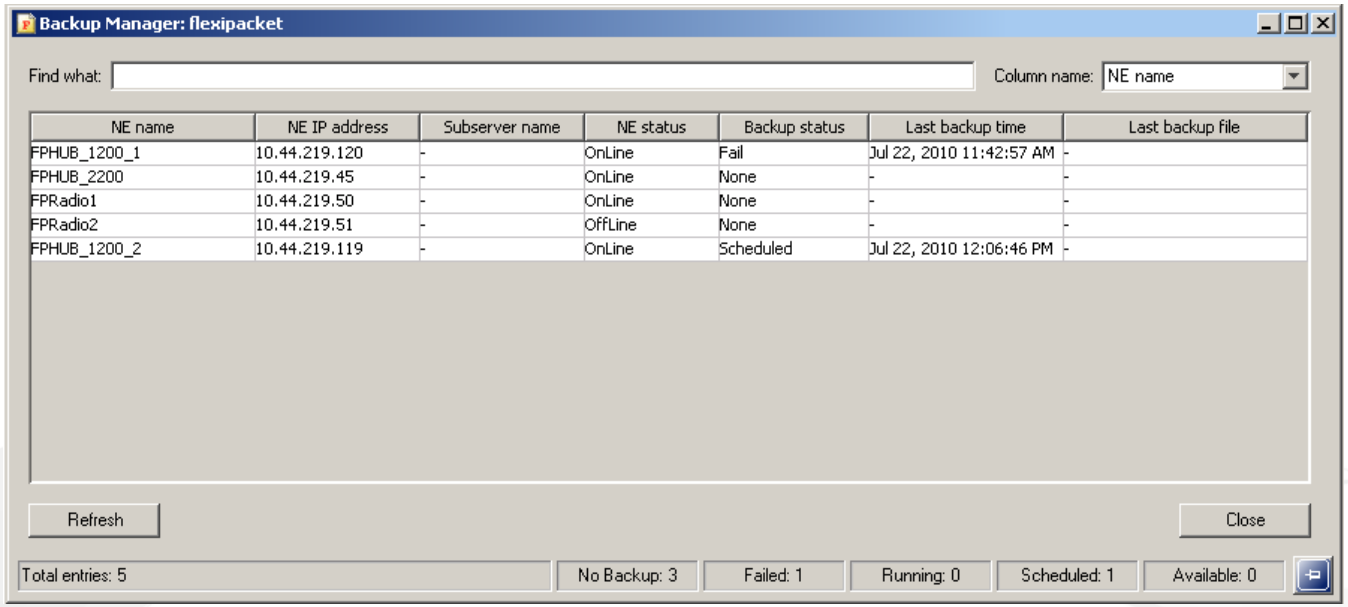


Automatic Backup Manager (I)

Backup manager application allows centralized and automatic management of backup operations.

Equipment supported are:

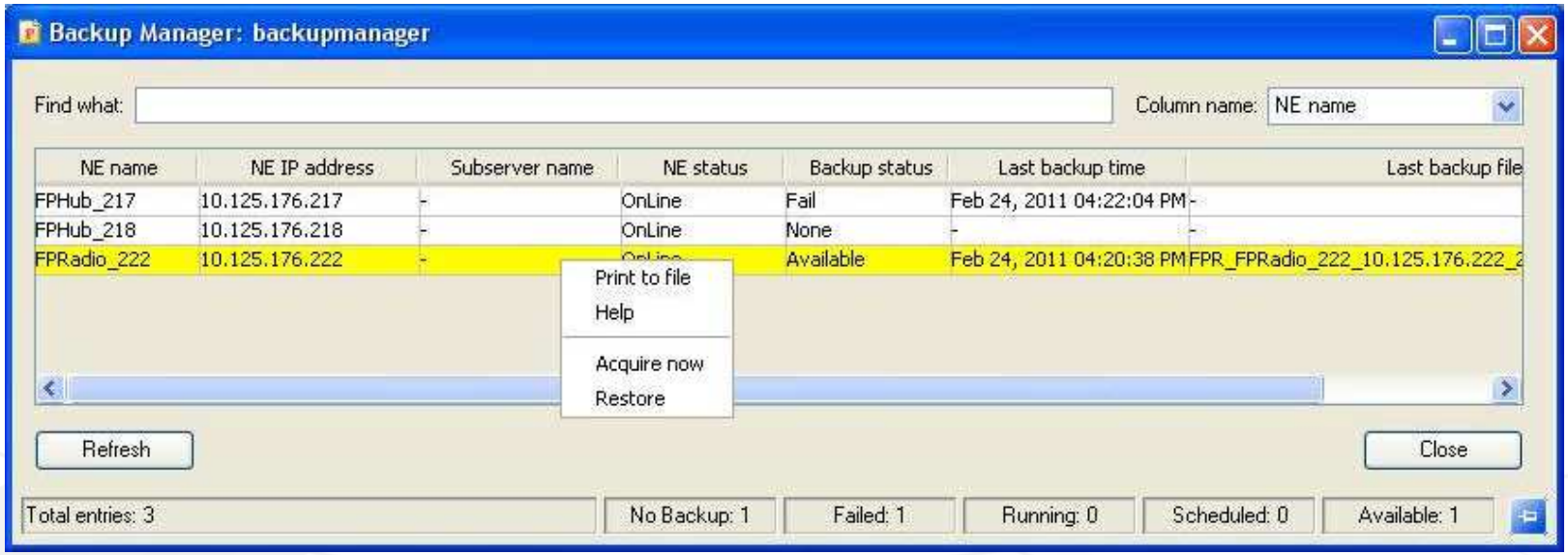
- Harmony Radio and MultiRadio
- Harmony FirstMile 200
- Harmony Hub 800



Automatic Backup Manager (II)

Backup file acquisition is scheduled when:

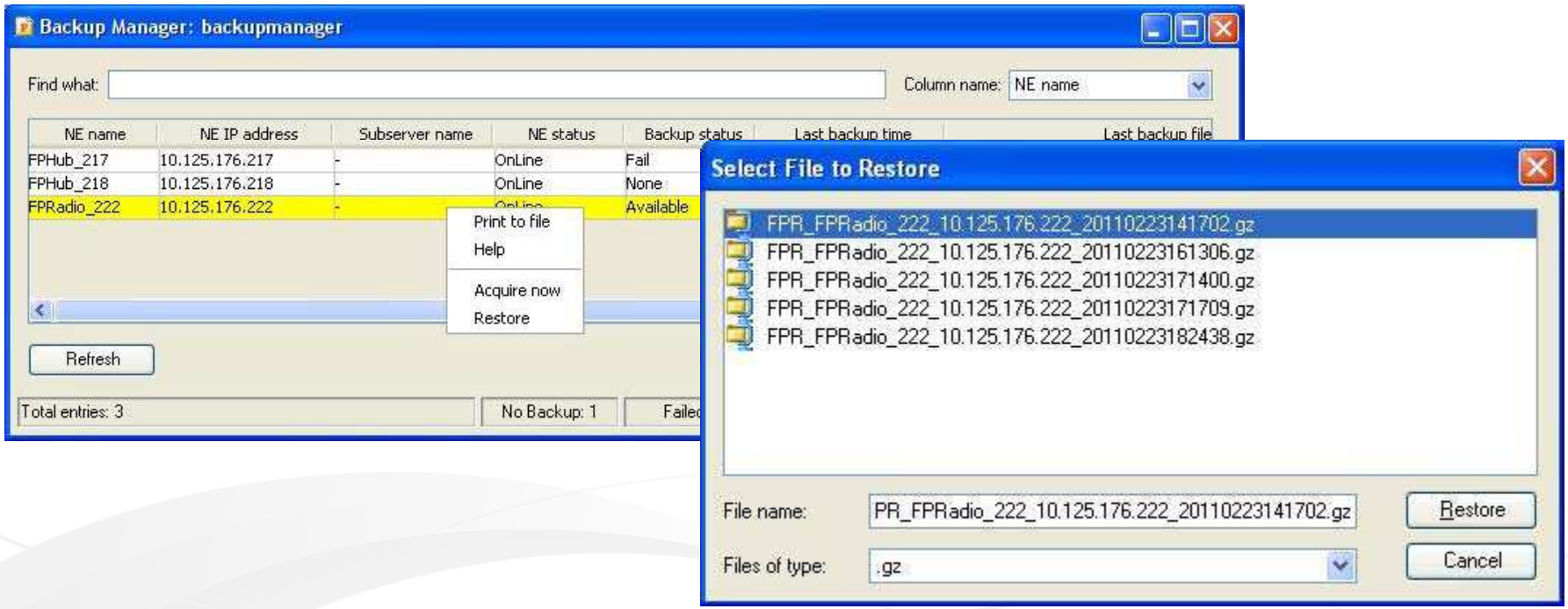
- New NE is inserted in topology map and the map is reloaded
- After modification of NE configuration done by user logged to DragonView
- Every time the NE is selected as eligible for backup from system scheduler
- Manually forced by user



Automatic Backup Manager (III)

Backup manager interface allows command providing:

- Restore function from DragonView user
- Up to 5 configuration files available for the selected NE



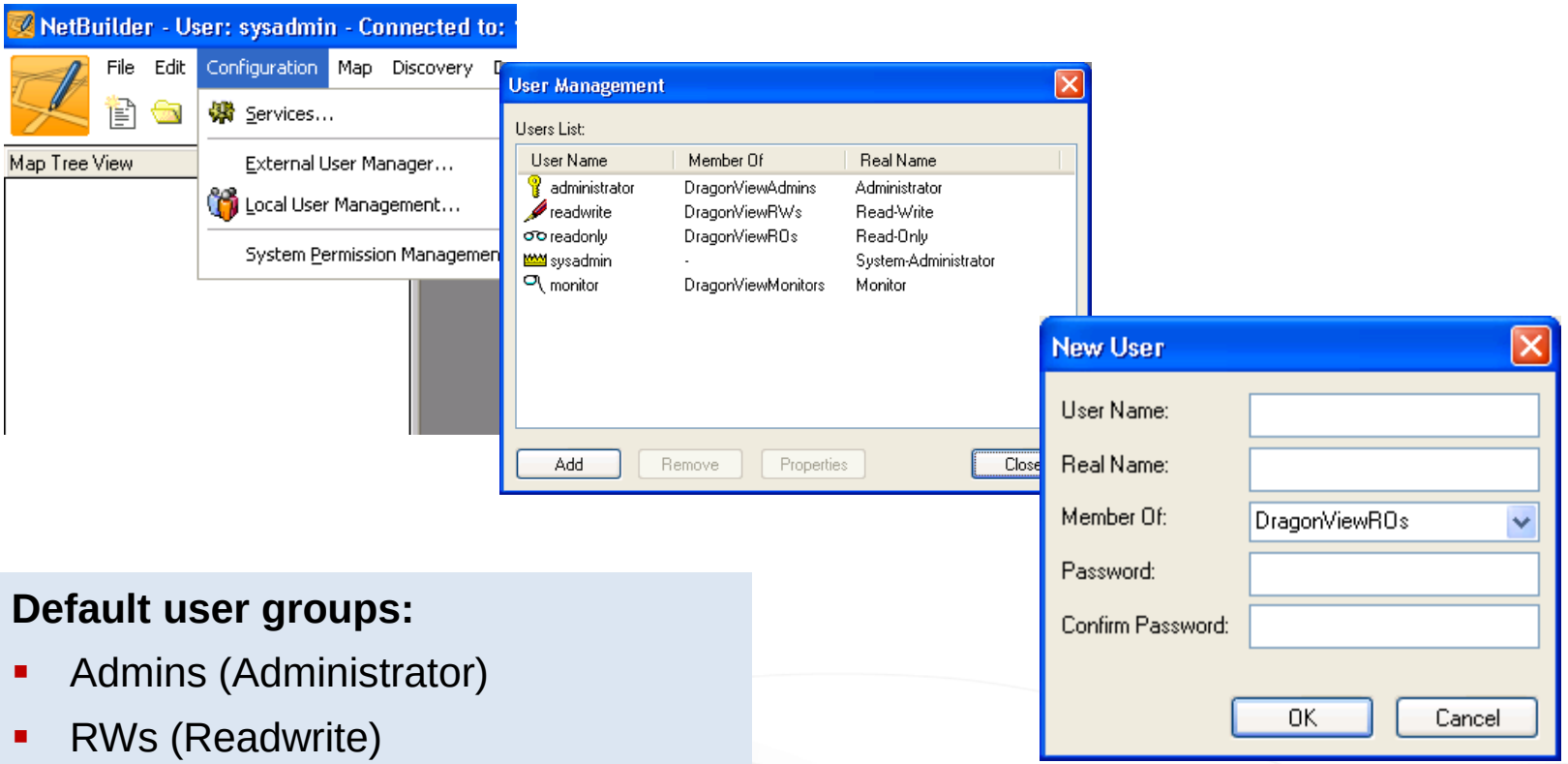
Security Management

Major security management functionalities:

- Account management via ID, Password
- Users management: user classes and groups
- Domain management
- External users management:
  - Microsoft Windows identity management (Active Directory)
  - Customer's identity manager (Active Directory)
- Operator log

Users Management and User Groups

Local user management tool



Default user groups:

- Admins (Administrator)
- RWs (Readwrite)
- ROs (Readonly)

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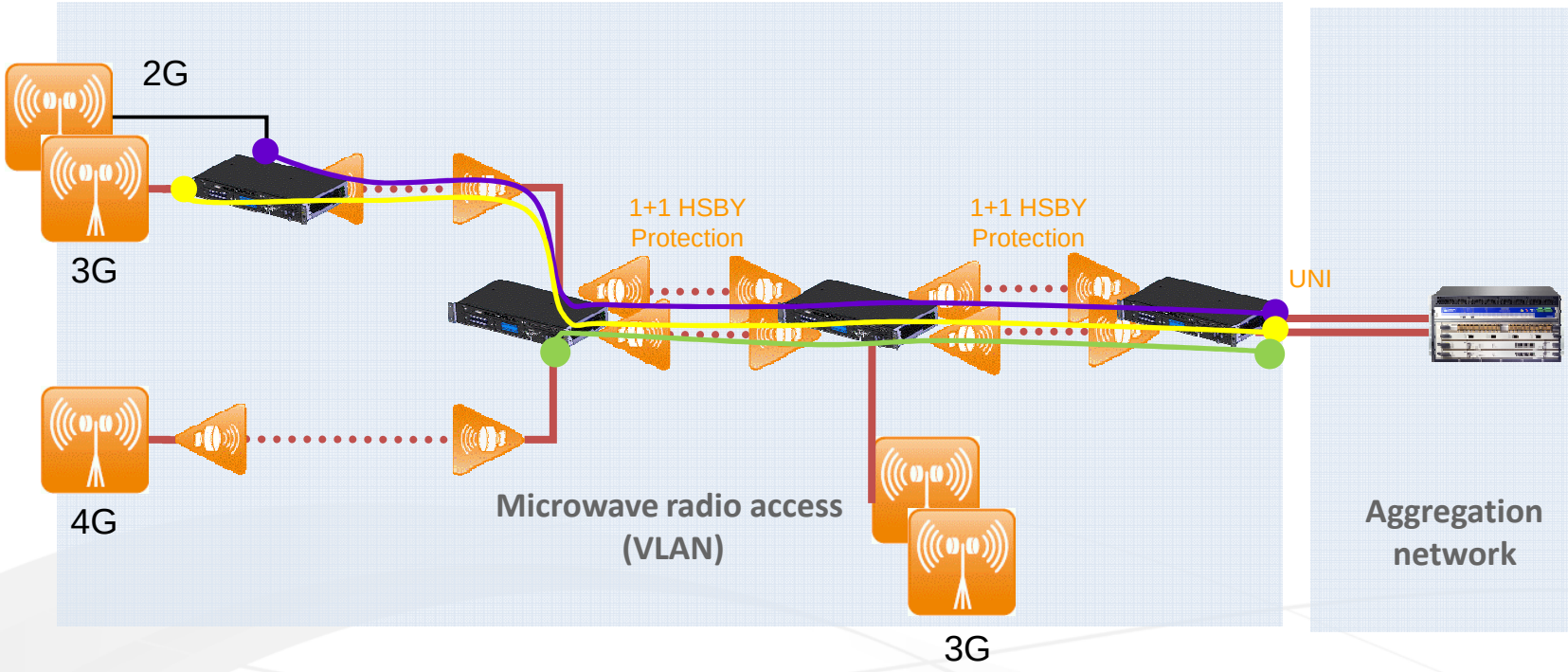
Summary

PathManager for Packet (I)

DragonView PathManager for Packet feature provides network management layer capability to easy E2E monitoring and provisioning of Ethernet services and VLAN in Harmony network

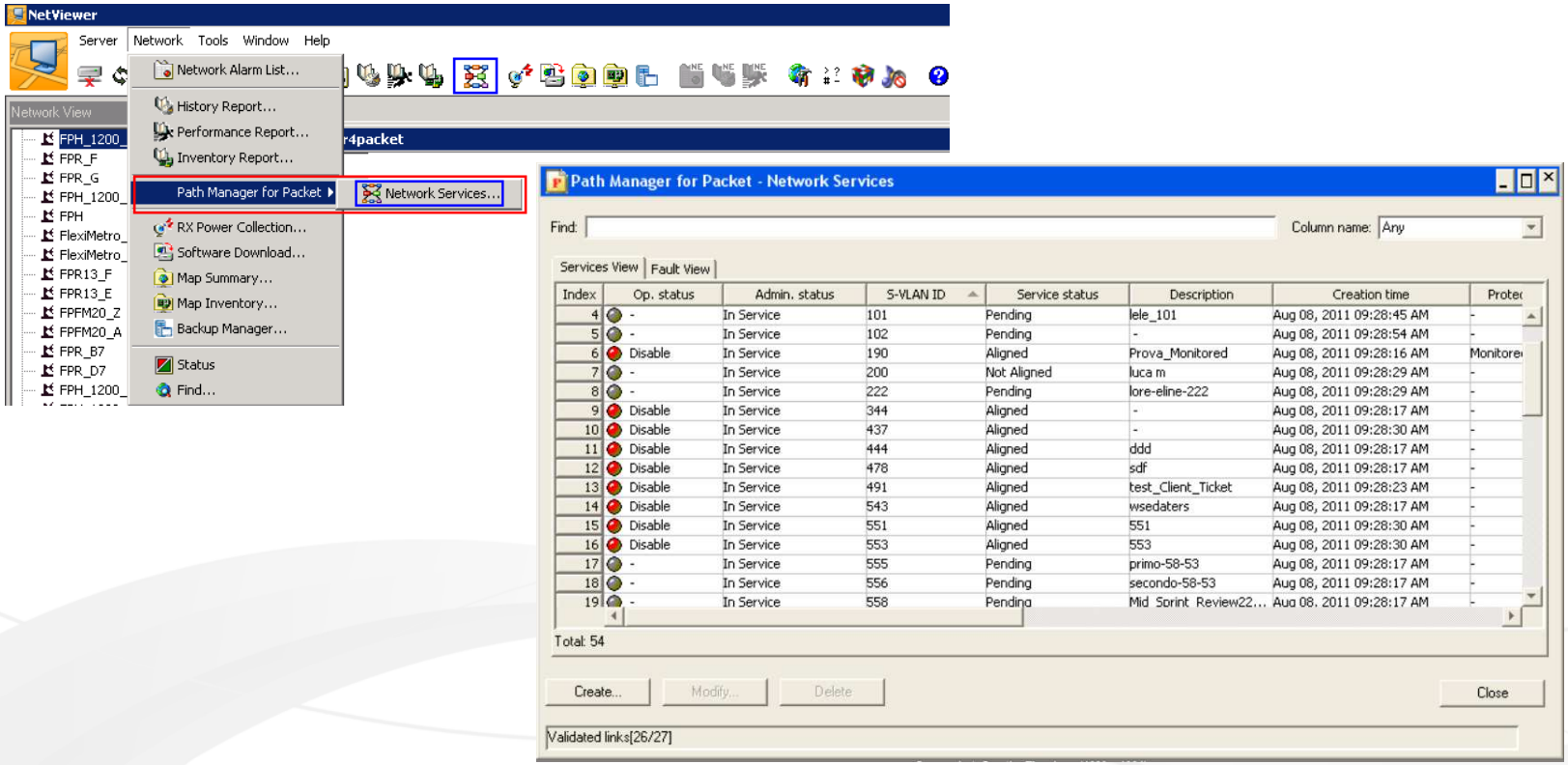


PathManager for Packet (II)

Network services list window

PathManager for Packet introduces network wise services view:

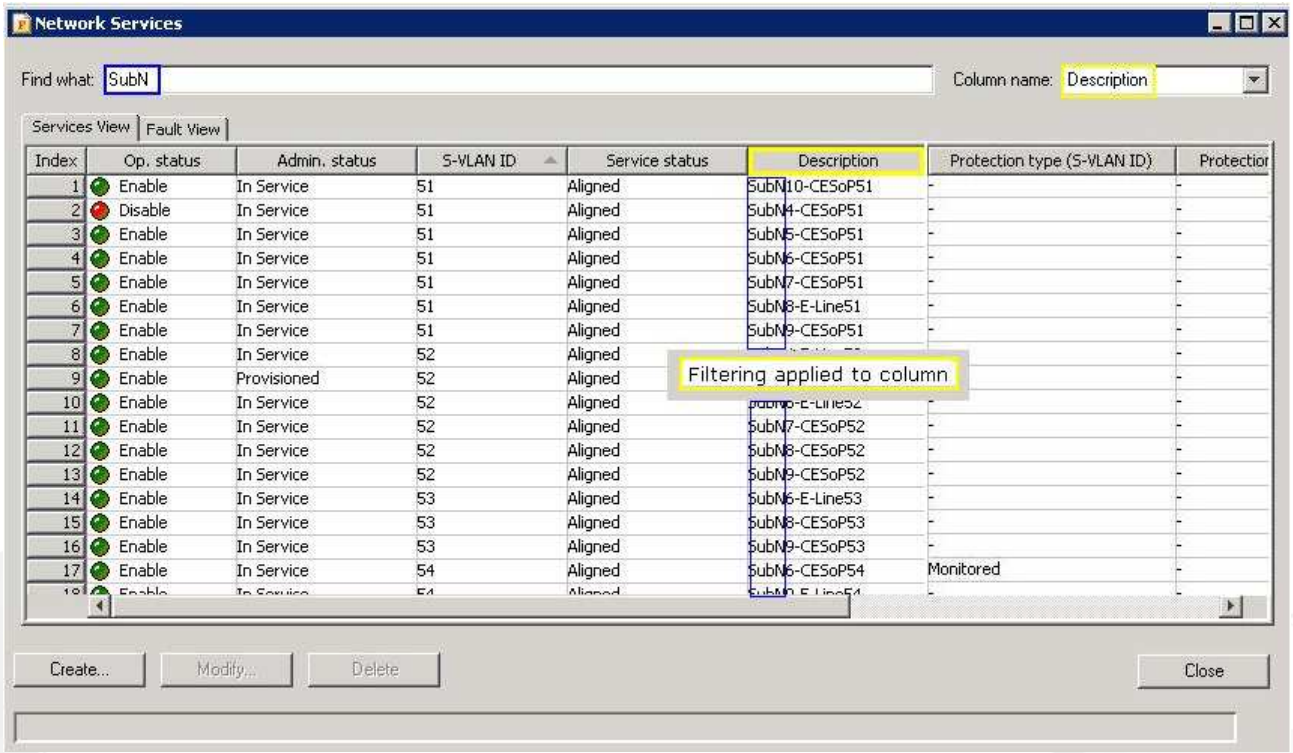
- one single table that show E-Line and CES (CESoP, SAToP, MEF8) provisioned in all network.



PathManager for Packet (III)

Search and filtering capabilities

- Network service list can be easily filtered, ordered and searched by content in each column: services are filtered while user is typing search key.
- After first filtering, it's possible to order all the columns to refine search.

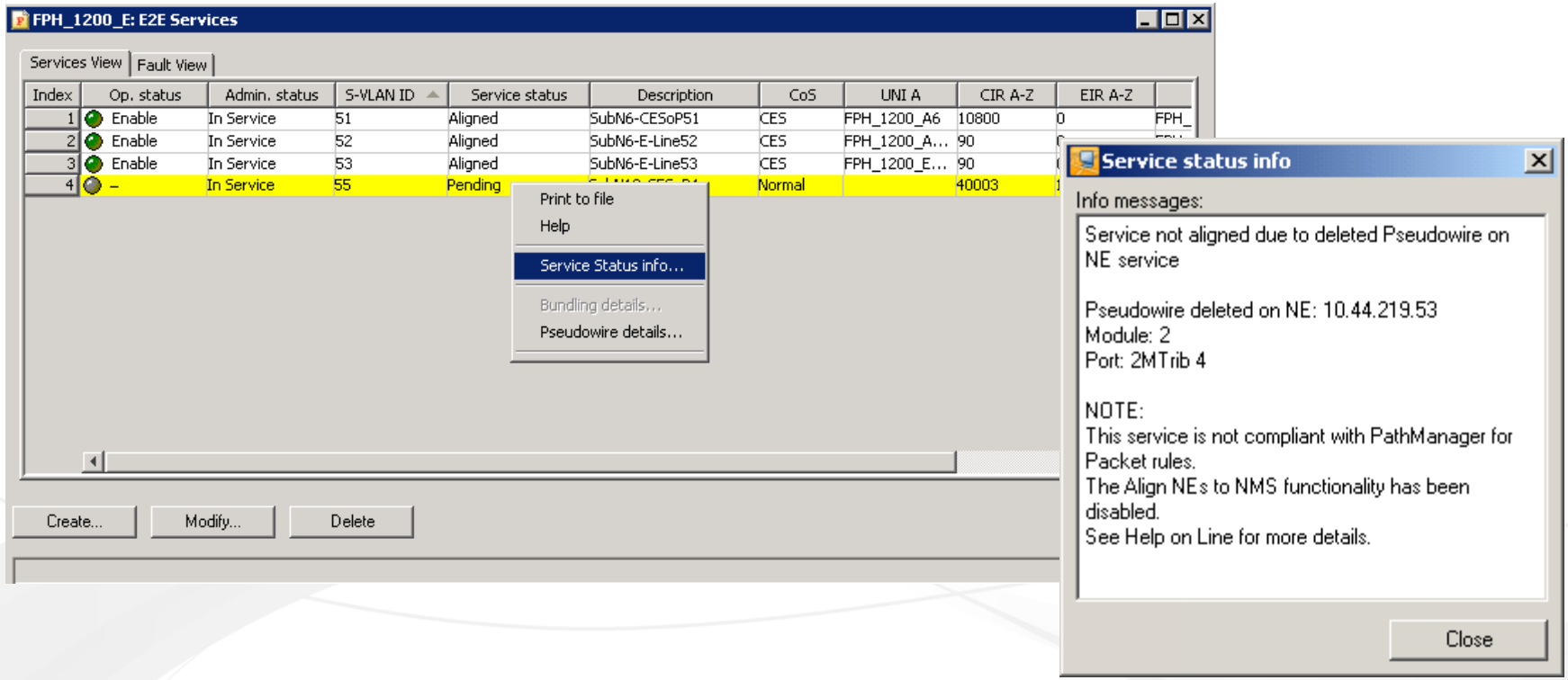


Index	Op. status	Admin. status	S-VLAN ID	Service status	Description	Protection type (S-VLAN ID)	Protectior
1	Enable	In Service	51	Aligned	SubN10-CESoP51	-	-
2	Disable	In Service	51	Aligned	SubN4-CESoP51	-	-
3	Enable	In Service	51	Aligned	SubN5-CESoP51	-	-
4	Enable	In Service	51	Aligned	SubN6-CESoP51	-	-
5	Enable	In Service	51	Aligned	SubN7-CESoP51	-	-
6	Enable	In Service	51	Aligned	SubN8-E-Line51	-	-
7	Enable	In Service	51	Aligned	SubN9-CESoP51	-	-
8	Enable	In Service	52	Aligned			-
9	Enable	Provisioned	52	Aligned			-
10	Enable	In Service	52	Aligned			-
11	Enable	In Service	52	Aligned	SubN7-CESoP52	-	-
12	Enable	In Service	52	Aligned	SubN8-CESoP52	-	-
13	Enable	In Service	52	Aligned	SubN9-CESoP52	-	-
14	Enable	In Service	53	Aligned	SubN6-E-Line53	-	-
15	Enable	In Service	53	Aligned	SubN8-CESoP53	-	-
16	Enable	In Service	53	Aligned	SubN9-CESoP53	-	-
17	Enable	In Service	54	Aligned	SubN6-CESoP54	Monitored	-

PathManager for Packet (IV)

Information about service status

- PathManager for Packet provides service configuration status information, showing to operator details about reason of partial or wrong E2E configuration



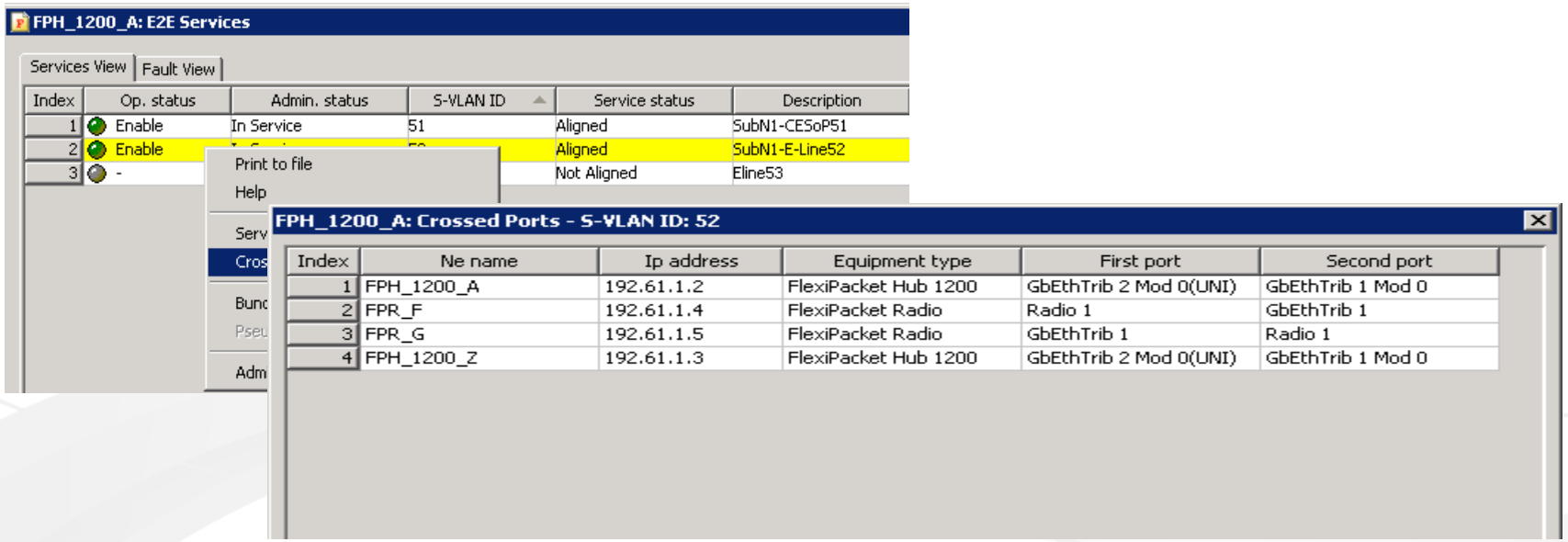
PathManager for Packet (V)

Service path details

PathManager for Packet display every network element name and ports involved in a service.

For each Network element are available the following data:

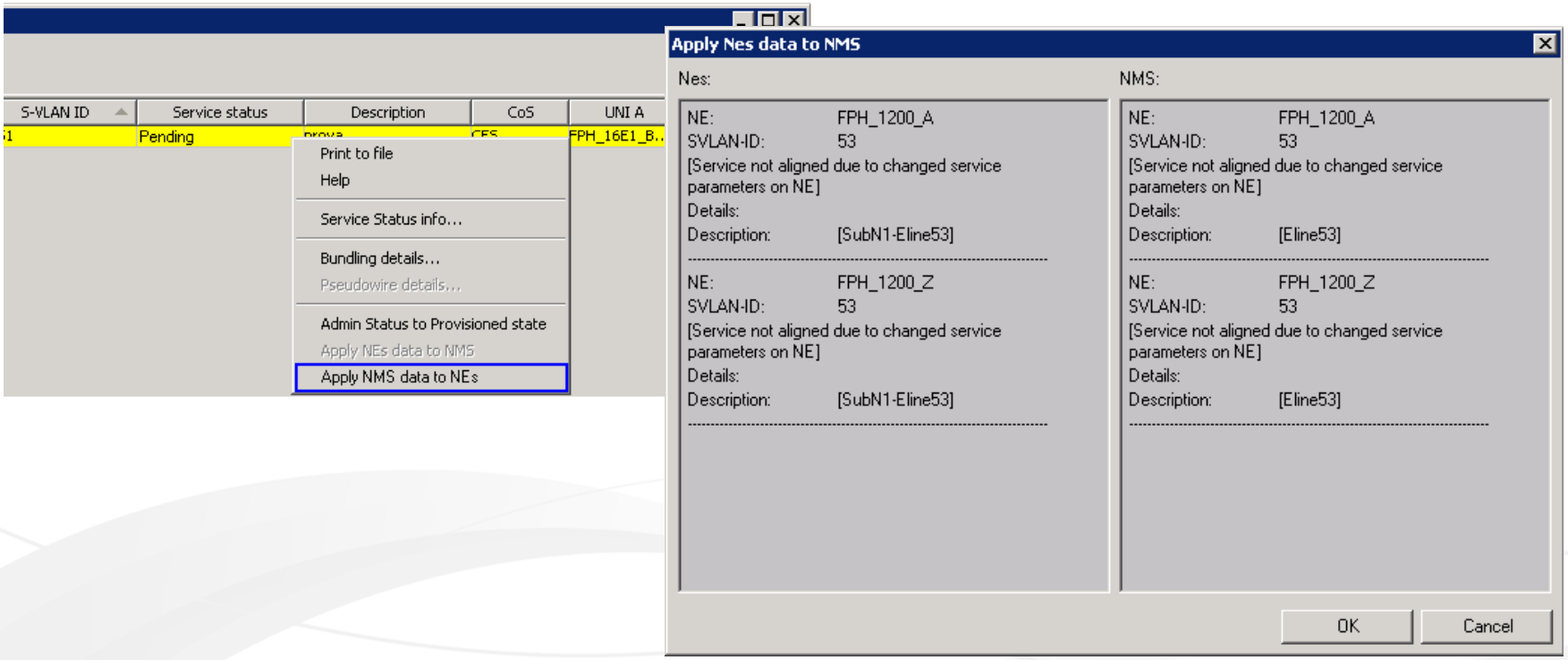
- Network element name
- IP address
- Equipment type
- First port (A-end), Second port (Z-end)



PathManager for Packet (VI)

Service alignment between database and network

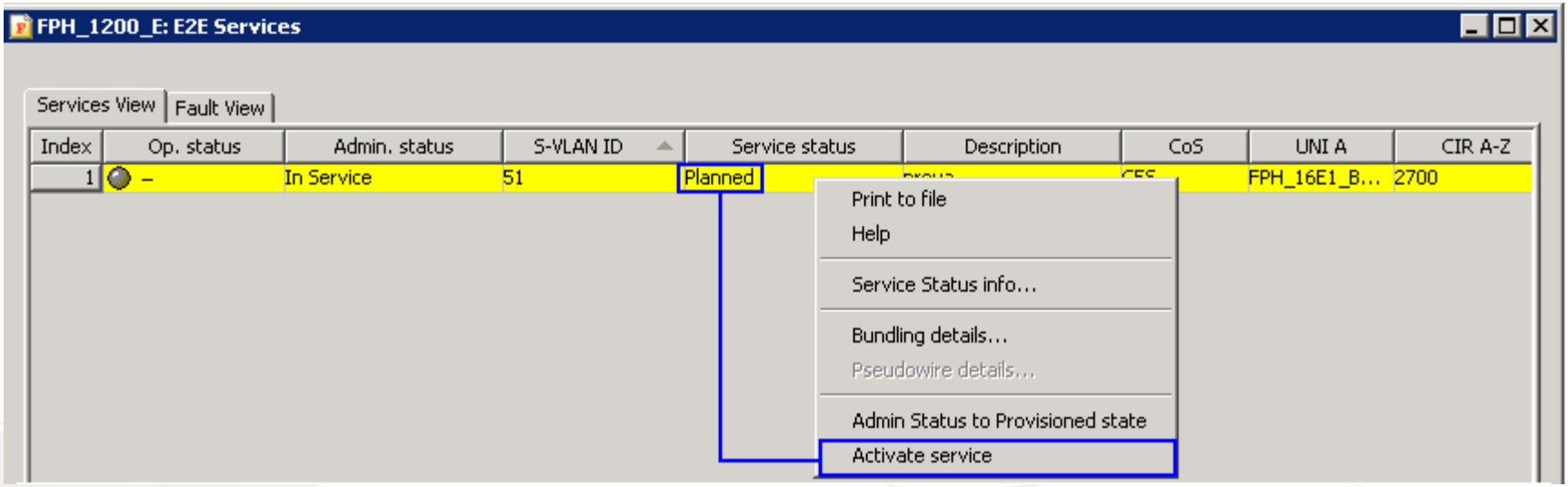
- PathManager for Packet stores into database E2E services configuration.
- In case of accidental modification of single NE, impacting E2E service traffic, operator can apply database stored configuration to network, re-establishing correctness of service



PathManager for Packet (VII)

Service provisioning in planned state

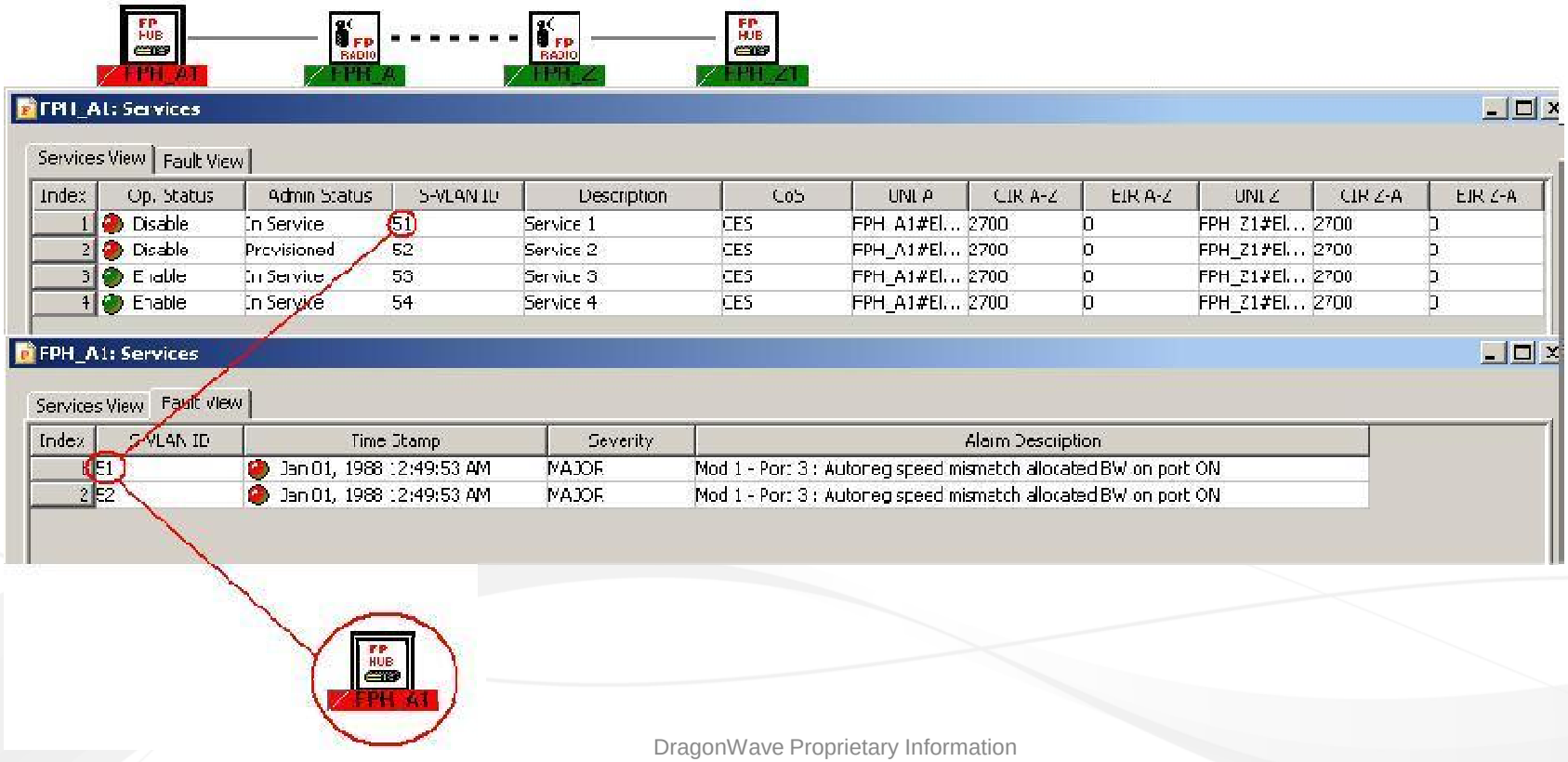
- Operator can create E2E service configuration at NMS level only, activating the service in second stage.
- PathManager for Packet stores into database the planned service configuration and it shows the service with specific status: planned



PathManager – Status of Monitored Services

Severity status of service:

- Root cause identification of service fault
- Highest severity and timestamp of the fault

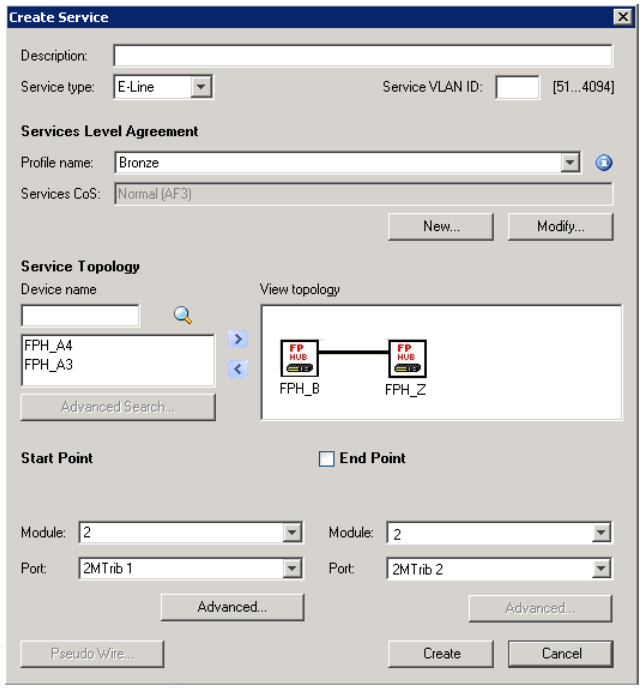


PathManager – E2E Provisioning Capability (I)

E2E Service provisioning feature

PM4P provides an easy procedure to create new Ethernet services over Harmony :

- Easy and simplified interface to create service
- E-LINE and CESoP provisioned in same way
- Guided path selection trough sites connected in NetBuilder
- No need to open each node

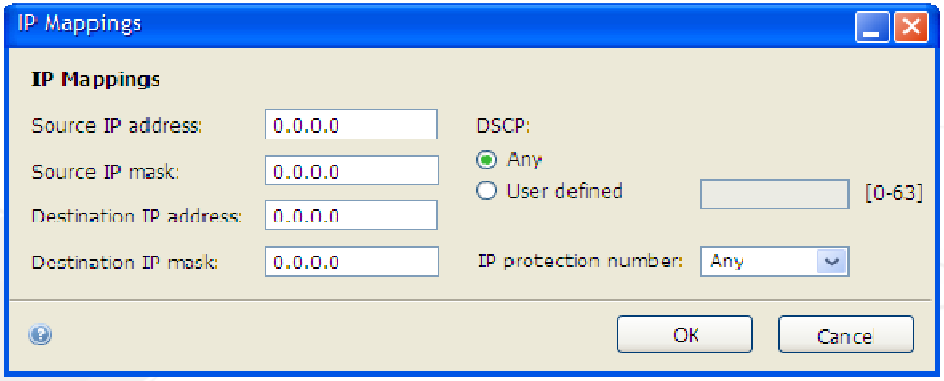


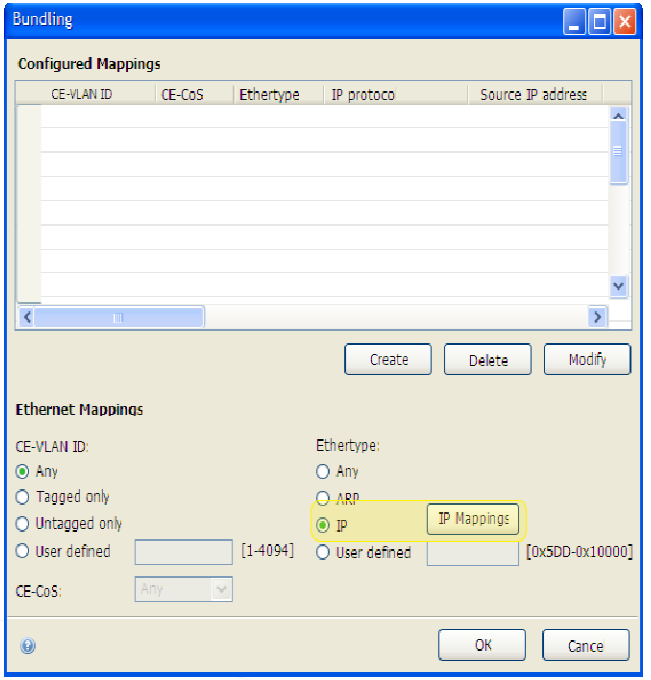
PathManager – E2E Provisioning Capability (II)

E2E Service provisioning feature

It provides all mappings criteria available in pseudo-wires services created in the Harmony network:

- Ethernet packets filtered and managed by:
- VLAN-ID (tagged, not-tagged, specific tag)
- Ethernet type (IP, ARP, custom Ethertype)
- IP address mapping
- IP payload protocol mapping (TCP, UDP, ICMP, IGMP)
- Differentiated Services Code Point (DSCP)



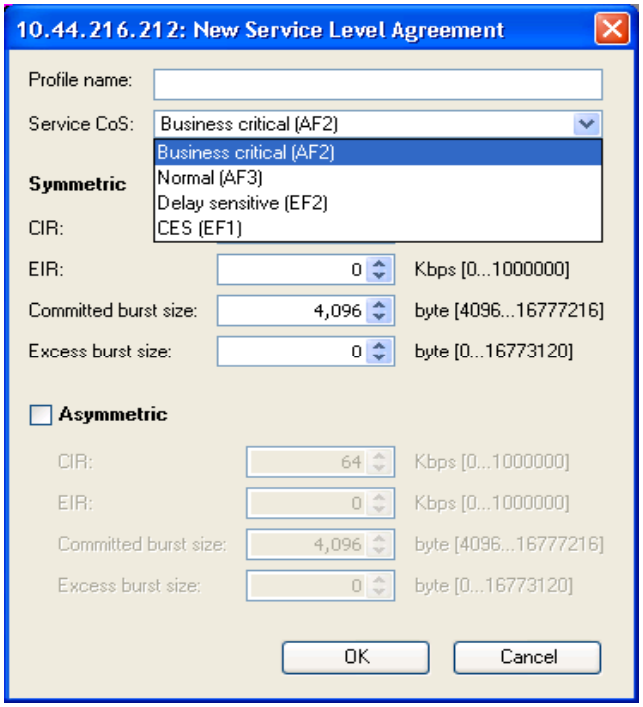


PathManager – E2E Provisioning Capability (III)

E2E Service provisioning feature

It provides profiles management:

- Network priority (Harmony Radio scheduler **QoS/CoS**)
- Bandwidth parameters for each service
- Committed Information Rate (**CIR**)
- Committed Burst Size (**CBS**)
- Excess Information Rate (**EIR**)
- Excess Burst Size (**EBS**)



PathManager – Network Scenarios (I)

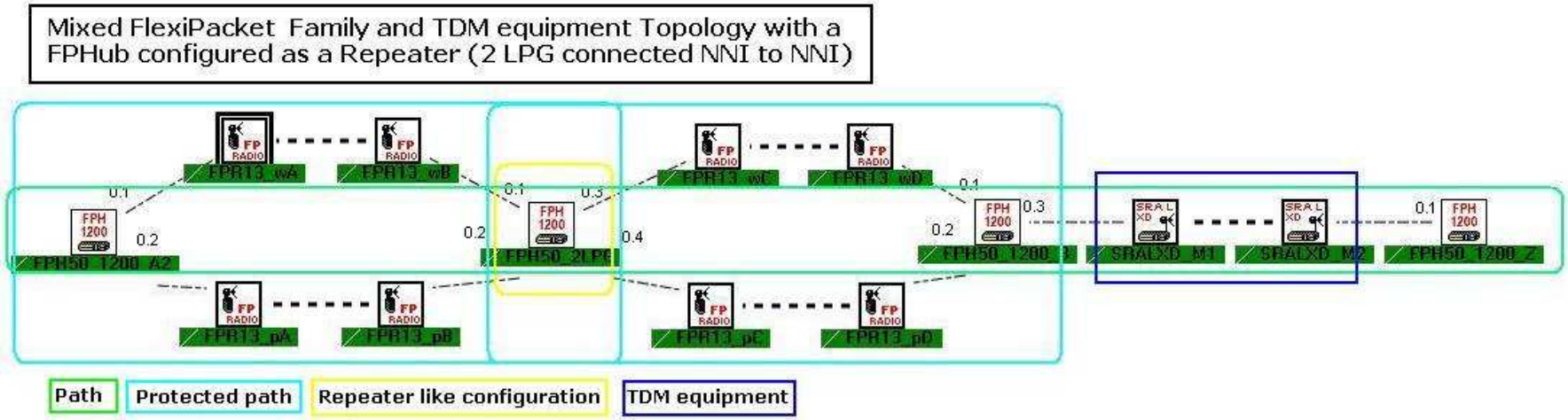
Network Topologies

The following cases and relevant combinations are managed:

- Service End Points on Harmony Hub 800 and Harmony FirstMile 200
- 1+0 microwave links through Harmony Radio
- 1+1 FD, 1+1 HF, 1+1 Hot Stand-by, 2+0 XPIC microwave links through Harmony Radio
- Chain / linear topology
- Tree / Y topology
- Ring topology

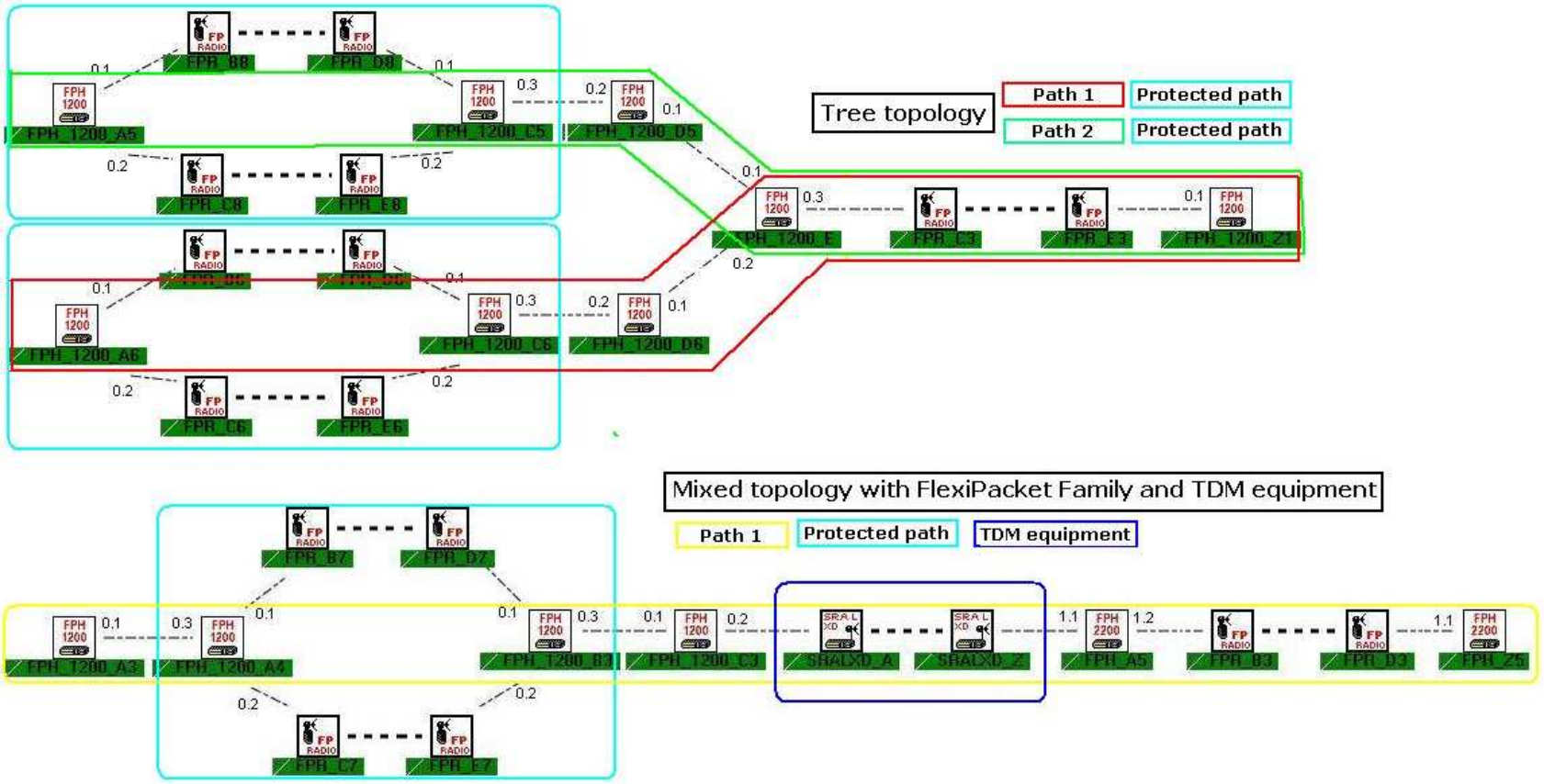
PathManager – Network Scenarios (II)

Network Topology



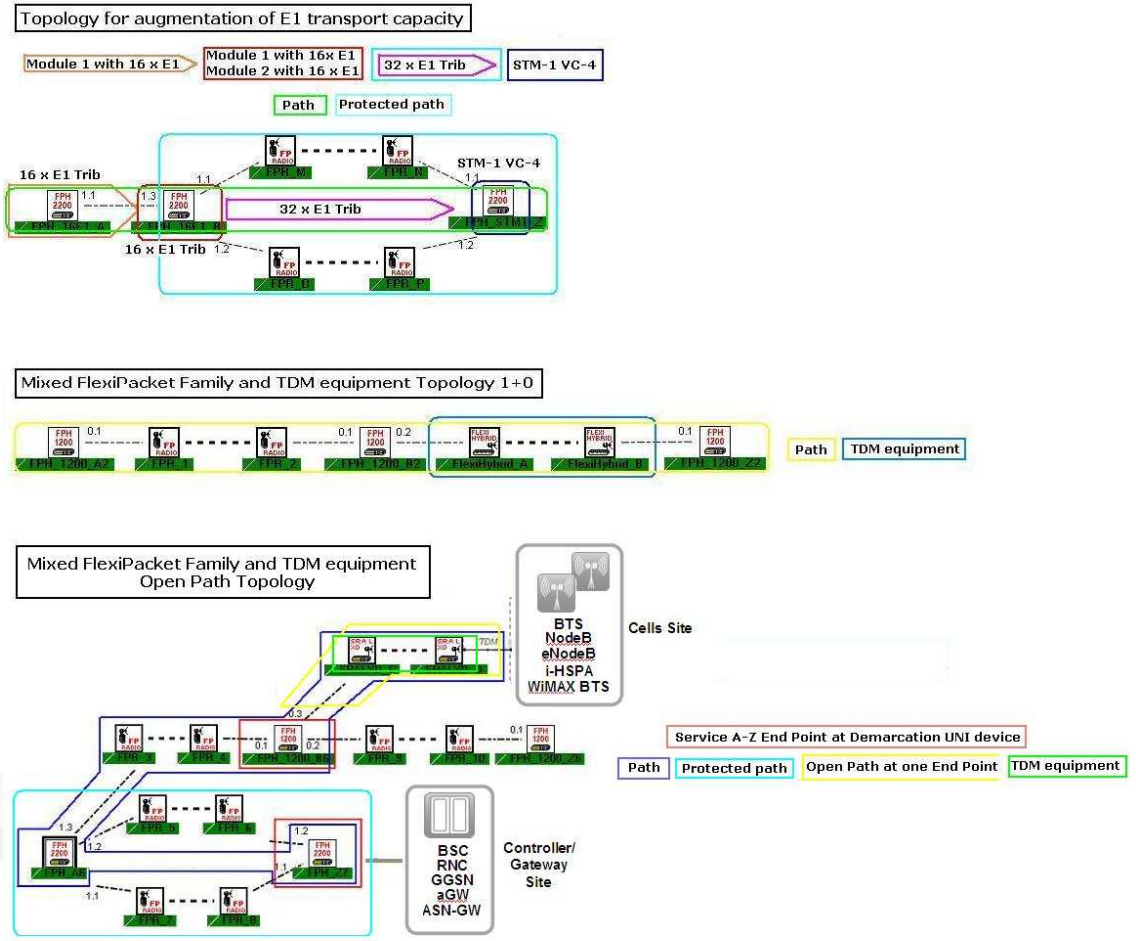
PathManager – Network Scenarios (III)

Network Topology



PathManager – Network Scenarios (IV)

Network Topology

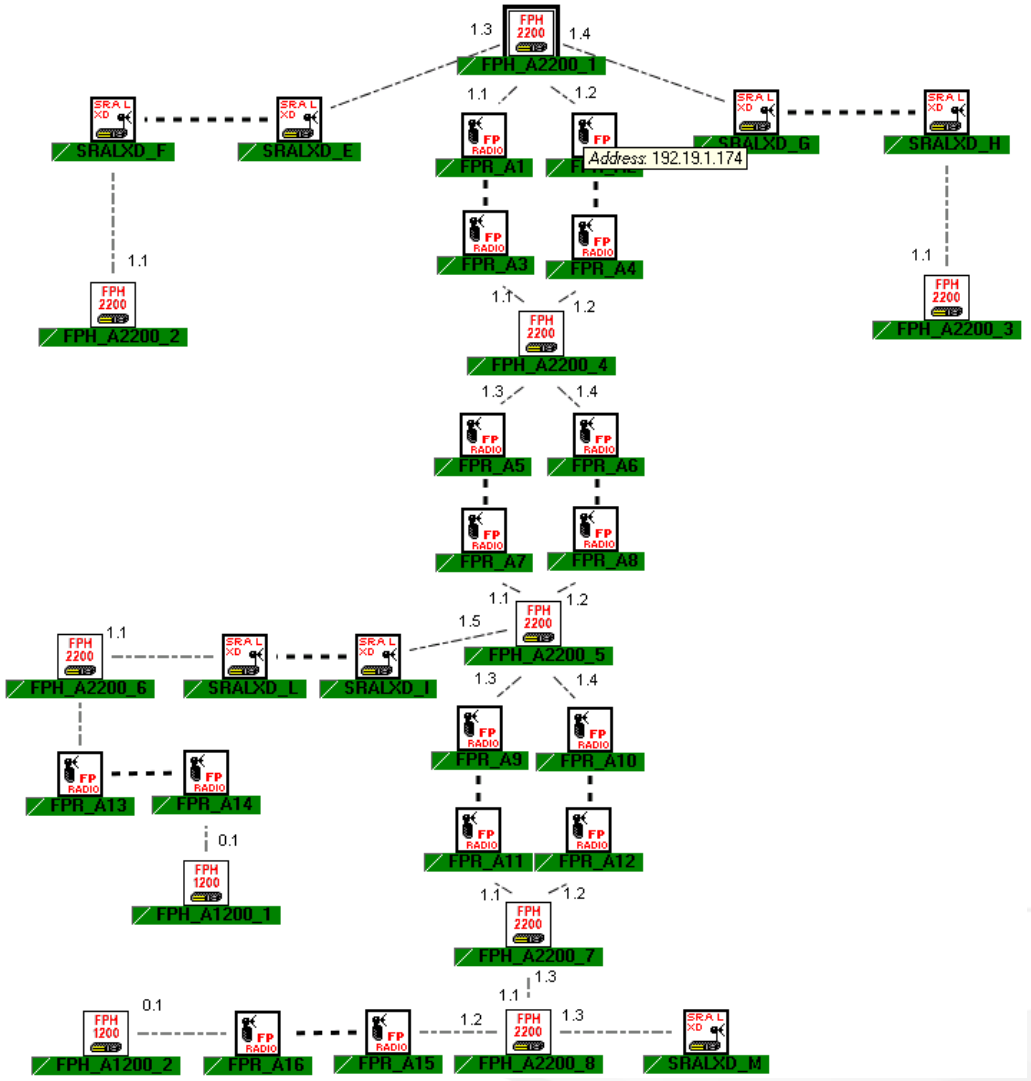


PathManager – Network Scenarios (V)

Network Topology

Star configurations

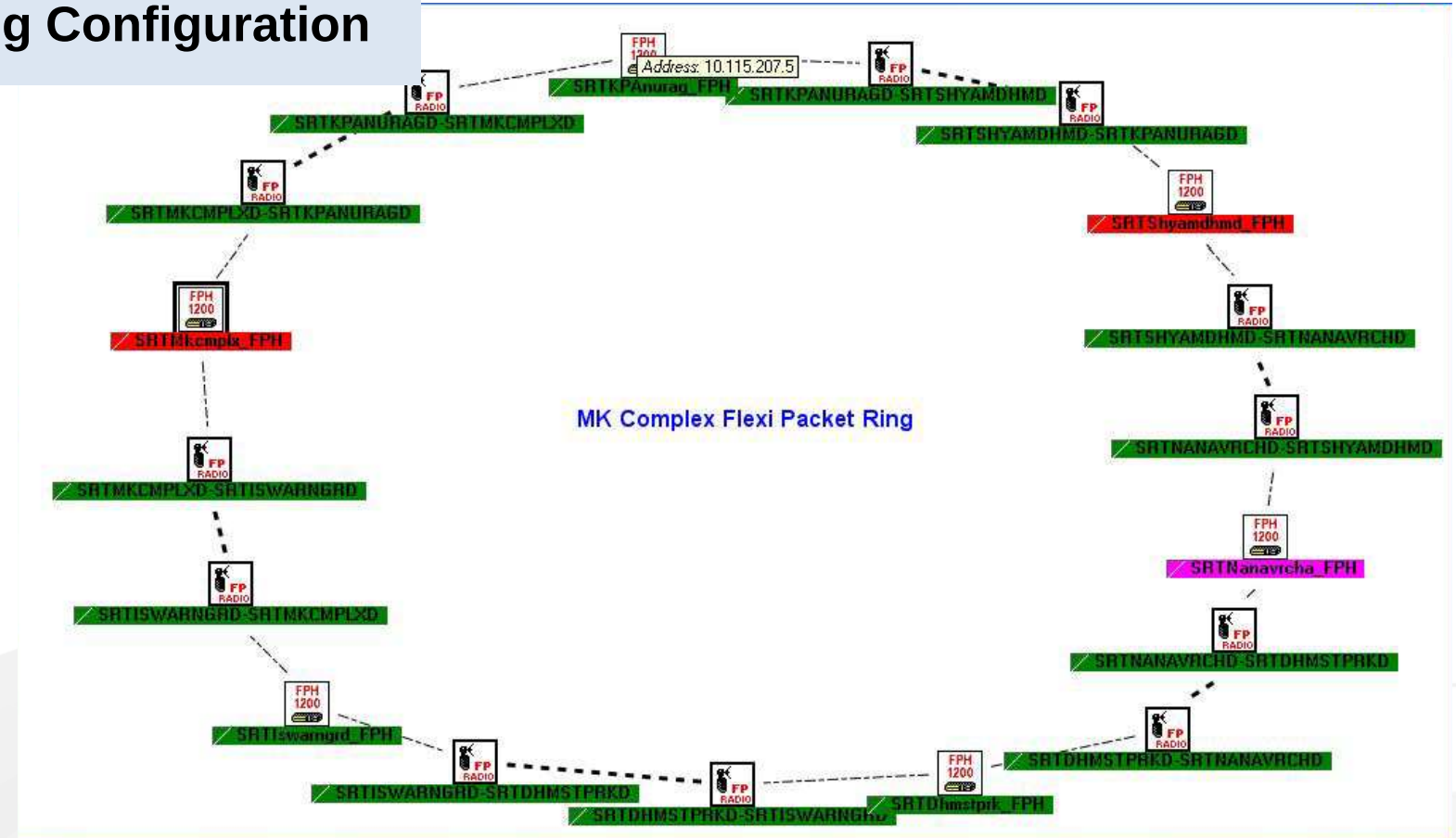
- Nx(1+0) + Mx(1+1)



PathManager – Network Scenarios (Vl)

Network Topology

Ring Configuration



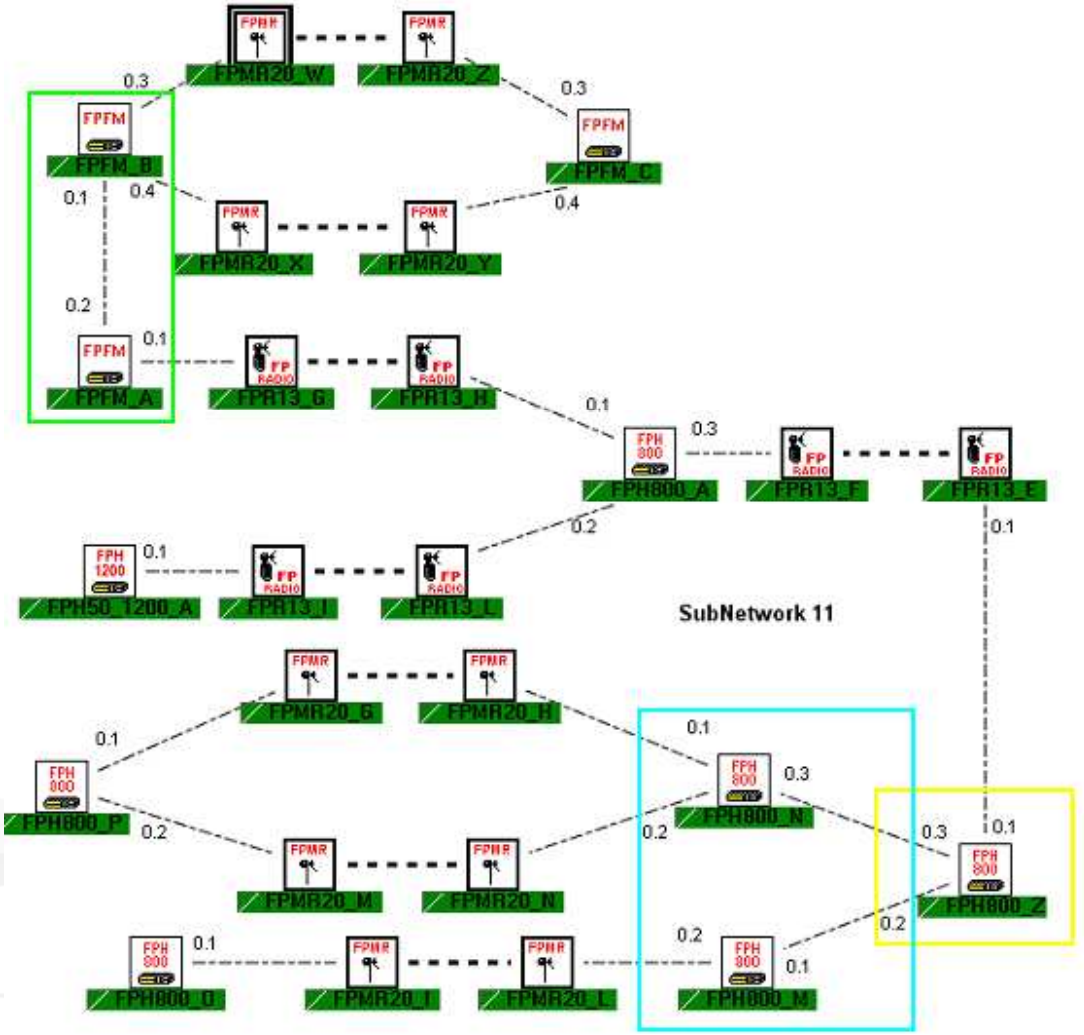
PathManager – Network Scenarios (VII)

Network Topology

Harmony Hub 800

Harmony FirstMile 200

Interconnected via Ethernet interface



Product highlights

Software architecture

Management functionalities overview (FCAPS)

E2E network management

Northbound interfaces and integrations

Hardware architecture and capability

Upgrade strategy

Details about NE-specific management capability

Summary

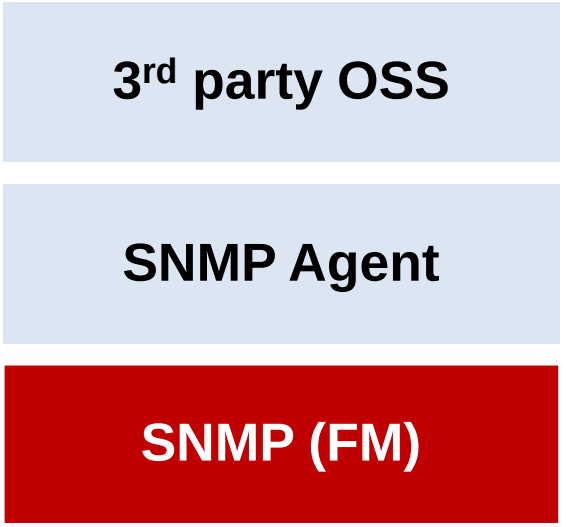
SNMP Northbound Interface

Northbound interface for fault management
Real time interface
SNMP interface based on SNMP V2c
Alarm format compliant to X.733
Alarm filtering configurable:

- Filtering per trap family
- Filtering per alarm description

Alarm acknowledgment:

- Acknowledgment from upper layer manager



OSS/J XML Data Exporter Interface

Massive batch Data Exporter interface for:

- Network resources inventory data
- Performance measurements data

Data export in XML format

XML file format compliant to 3GPP standard:

- Performance data compliant to TS32.401 V6.2.0 standard
- Inventory data compliant to TS32.625 V6.2.0 standard

Data transfer over HTTP and FTP

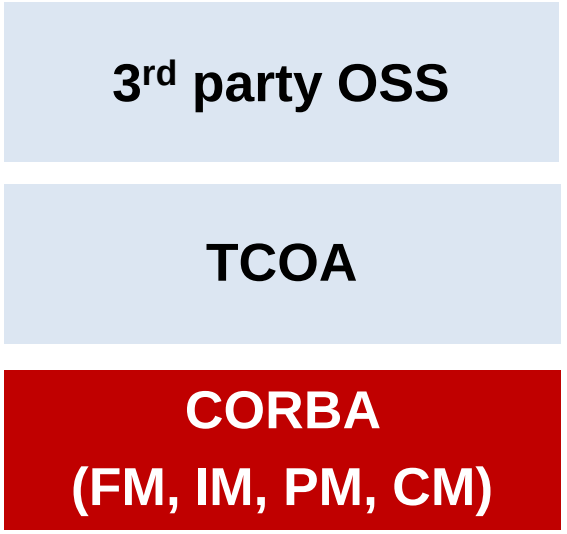
TMF 814 CORBA Agent (TCOA)

Compliance to TMF (Telecommunication Management Forum) standardization

- CORBA Agent based on TMF 814 v2.1
- Network resources information model based on TMF 608 v2.1
- interface management based on TMF 513

Management functionality supported (availability depending on equipment type)

- Fault notification forwarding
- Network inventory data export
- Performance data export



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Hardware Configurations

DragonView is available/planned in the following configurations.

Entry Notebook

- Managed NE's: up to 100
- Client and server in the same notebook
- No additional software modules

Entry

- Managed NE's: up to 200
- Client and server applications in the same PC
- No additional software modules

Single Server

- Managed NE's: up to 3.200 (weighted), up to 1.250 (real, in rel. 10.5), up to 2.500 (real, beyond rel. 10.5)
- One server and Up to 20 clients
- Disk mirroring and Warm Stand-by

Multi Server (planned in release 11.0)

- Managed NE's: up to 22.250 (weighted), up to 7.500 (real, in rel. 11.0), up to 20.000 (real, beyond rel. 11.0)
- One master server and up to 10 slave servers
- Up to 20 clients
- Disk mirroring, Warm Stand-by (for Master Server) and Enhanced Warm Stand-by (for Slave Servers)

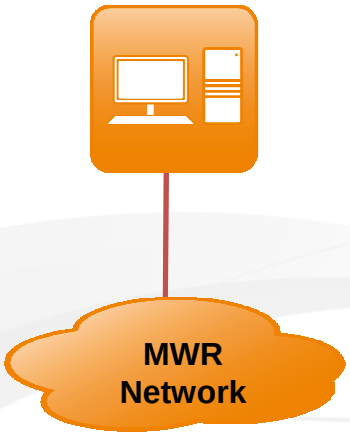
Entry Configuration

Entry Notebook

Entry Notebook

- Managed NE's: up to 100
- Client and Server in the same Notebook
- No additional software modules

Entry

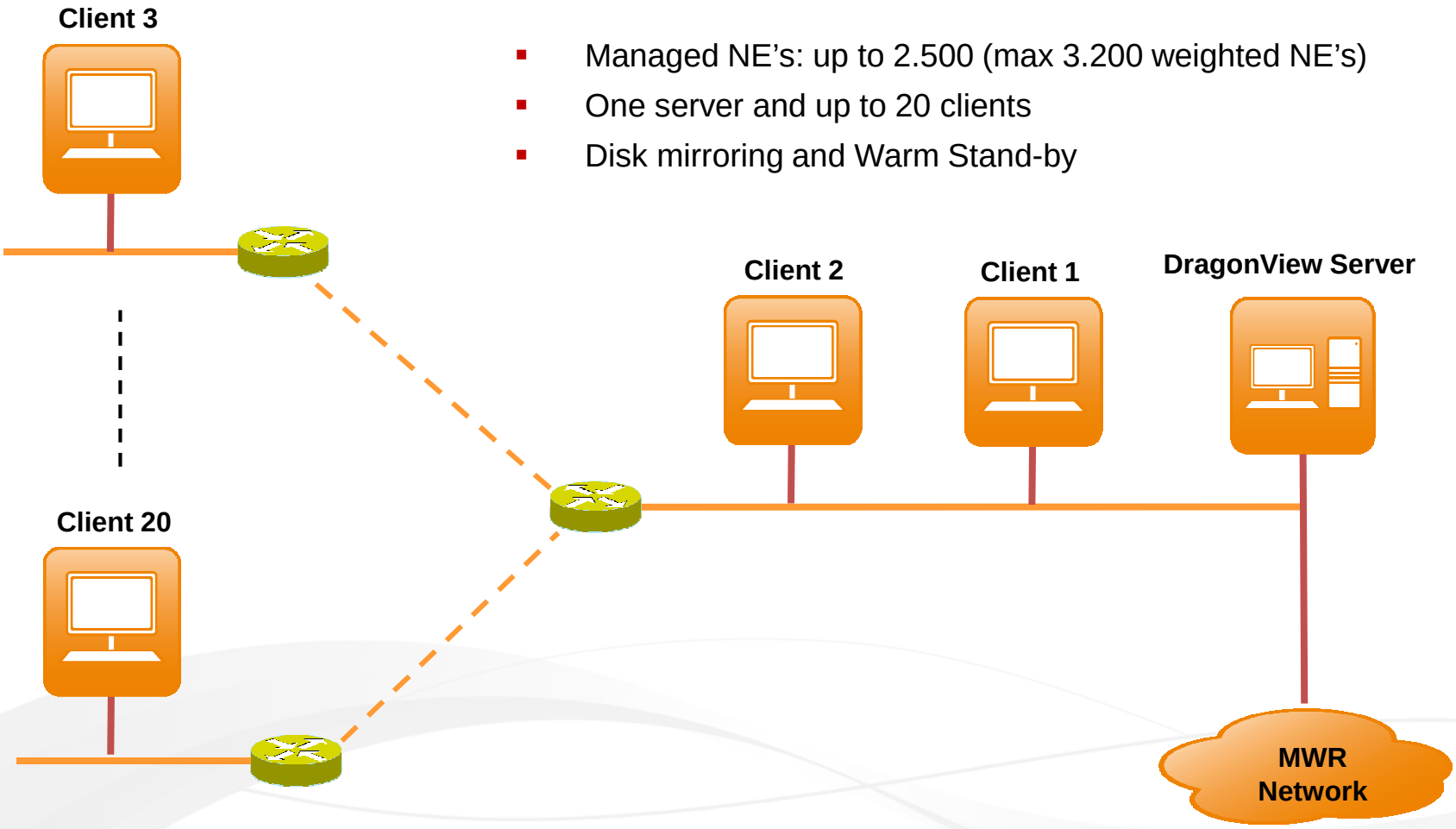


Entry

- Managed NE's: up to 200
- Client and Server in the same Notebook
- No additional software modules

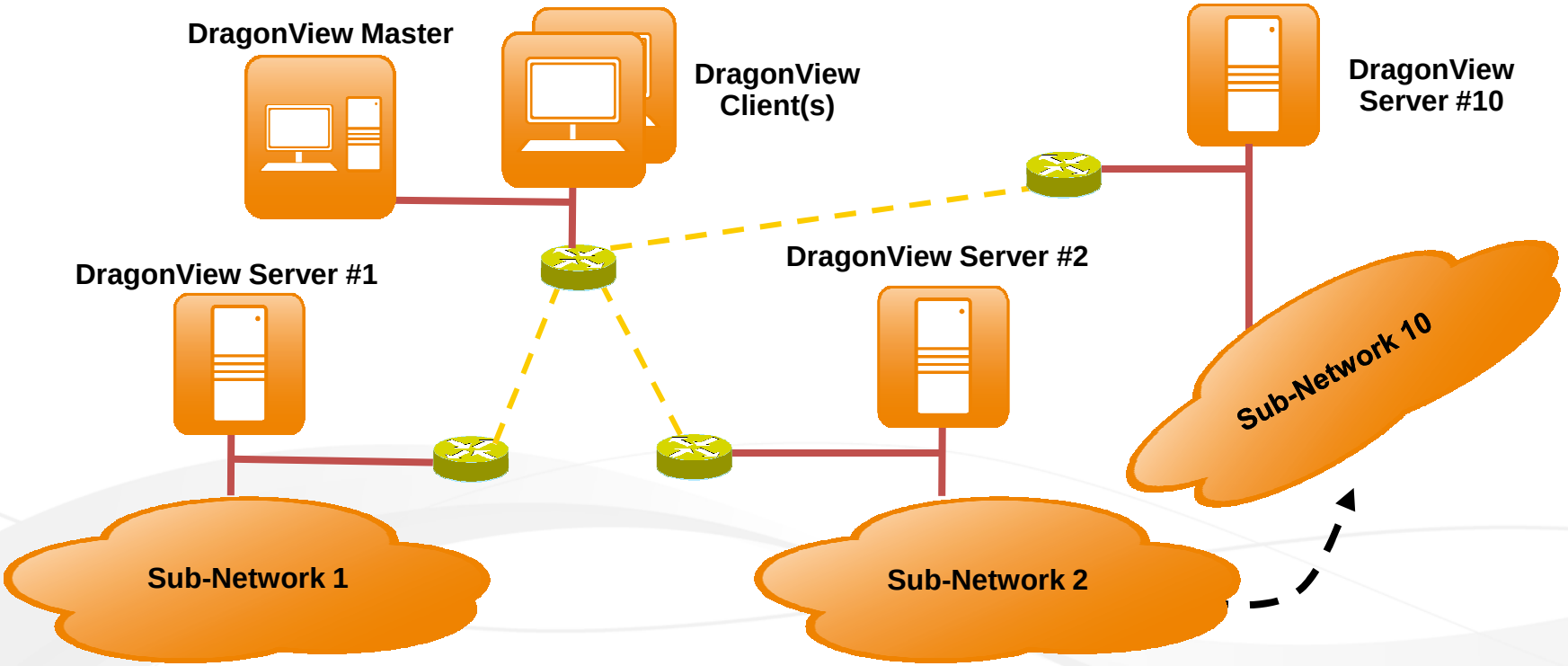
Single Server Configuration

- Managed NE's: up to 2.500 (max 3.200 weighted NE's)
- One server and up to 20 clients
- Disk mirroring and Warm Stand-by



Multi-Server Configuration (planned for future rels.)

- Managed NE's: up to 7.500 (min) to 20.000 (planned) real NE's
- One master server and up to 10 slave servers
- Up to 20 clients
- Disk mirroring, 1:1 Warm Stand-by and Enhanced N:M Stand-by HA deployments



System Availability

Protection methods to increase the system availability

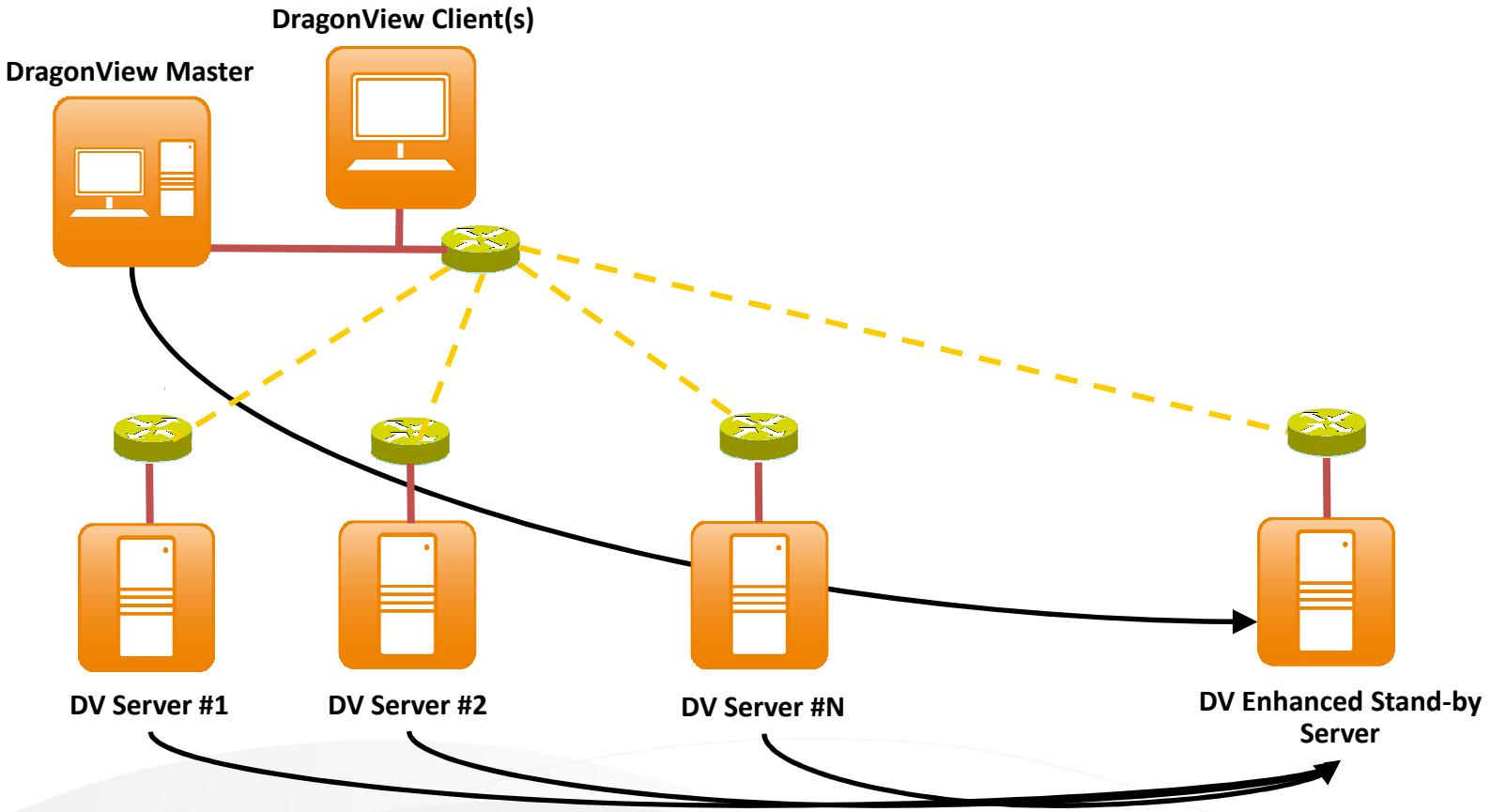
- Warm Stand-by protection for single server
- 1:1 Warm Stand-by protection for Single Server and Master Server
- N:M Enhanced Stand-by protection for multi server configuration

- Database back-up and restore
- Database auto archive

- Disk mirroring support

- UPS units

Enhanced N:M Stand-by configuration



Automatic alignment procedure applies to:

Maps, server configuration, user profiles, server database

DragonView: Data Base and Operating Systems

Support of

- MS Windows 7 32bit and 64bit for Client
- MS Windows Server 2008 R2 64bit for Server
- MS SQL Server 2008 SE
- Compatibility with Citrix multi-release and XenApp 5.0

DragonView: HW

Compatibility with standard x86 Servers

- FSC TX 300 (as an example)

Compatibility with HP HW Blade servers in rack

- HP ProLiant BL460c G6

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Upgrade Procedure (not applicable to release 10.5)

Table of data that is planned to be imported once upgrading DragonView

DragonView Database	NO
Network Maps	YES
User Data	YES

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DragonView 10.5

Horizon Compact+ (I)

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management (to be confirmed)
1.1	Detailed alarms displayed into NE alarm list and Network Alarm List	Configuration via dedicated DragonView Plug-in	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Ethernet counters: • graphical representation • data stored into NetViewer Database Ethernet statistics • Data at 15' and 24h collected into NetViewer Database

Horizon Compact+ (II)

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
1.1	Fault management	Not supported	Not supported	Not supported

PathManager for Packet

Managed Releases	Service Fault Management	Service configuration Management
1.1	Not supported	Not supported

Horizon Quantum (I)

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management (to be confirmed)
1.2	Detailed alarms displayed into NE alarm list and Network Alarm List	Configuration via dedicated DragonView Plug-in	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Ethernet counters: • graphical representation • data stored into NetViewer Database Ethernet statistics • Data at 15' and 24h collected into NetViewer Database

Horizon Quantum (II)

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
1.2	Fault management	Not supported	Not supported	Not supported

PathManager for Packet

Managed Releases	Service Fault Management	Service configuration Management
1.2	Not supported	Not supported

Horizon Compact (I)

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management (to be confirmed)
1.4.7	Detailed alarms displayed into NE alarm list and Network Alarm List	Configuration via dedicated DragonView Plug-in	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Ethernet counters: • graphical representation • data stored into NetViewer Database Ethernet statistics • Data at 15' and 24h collected into NetViewer Database

Horizon Compact (II)

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
1.4.7	Fault management	Not supported	Not supported	Not supported

PathManager for Packet

Managed Releases	Service Fault Management	Service configuration Management
1.4.7	Not supported	Not supported

Harmony MultiRadio (I) – Planned for future releases

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management
2.1 SU2	Detailed alarms displayed into NE alarm list and Network Alarm List	Via equipment WebLCT remote launch	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Performance data availability via Equipment WebLCT Ethernet counters: • graphical representation RX power: • Data recording into DragonView Database • RX power graphical representation

Harmony MultiRadio (II) – Planned for future releases

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
2.1 SU2	Fault management	• Fault management • HW/SW Inventory	• HW/SW Inventory • Performance	• Fault management • Performance • Topology data export

PathManager for Packet

Managed Releases	Service Fault Management	Service configuration Management
2.1 SU2	Alarm Correlation	Service pass through

Harmony Radio Hybrid (I) – Planned for future rels.

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management
H2.1 SU1	Detailed alarms displayed into NE alarm list and Network Alarm List	Via equipment WebLCT remote launch	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Performance data availability via Equipment WebLCT Ethernet counters: • graphical representation RX power: • Data recording into DragonView Database • RX power graphical representation

Harmony Radio Hybrid (II) – Planned for future rels.

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
H2.1 SU1	Fault management	Not supported	Not supported	• Fault management • Performance • Topology data export

Harmony First Mile 200 (I) – Planned for future rels.

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management
2.0	Detailed alarms displayed into NE alarm list and Network Alarm List	Via equipment WebLCT remote launch	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Availability via Equipment WebLCT

Harmony First Mile 200 (II) – Planned for future rels.

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
2.0	Fault management	• Fault management • HW/SW Inventory	• HW/SW Inventory • Performance	• Fault management • Performance • Topology data export

PathManager for Packet

Managed Releases	Service Fault Management	Service configuration on Management
2.0	Alarm Correlation	• E-line • CESoP • SAToP

Harmony Hub 800 (I) – Planned for future rels.

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management
2.0 SU1	Detailed alarms displayed into NE alarm list and Network Alarm List	Via equipment WebLCT remote launch	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Availability via Equipment WebLCT

Harmony Hub 800 (II) – Planned for future rels.

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
2.0 SU1	Fault management	• Fault management • HW/SW Inventory	• HW/SW Inventory • Performance	• Fault management • Performance • Topology data export

PathManager for Packet

Managed Releases	Service Fault Management	Service configuration Management
2.0 SU1	Alarm Correlation	• E-line • CESoP • SAToP

Harmony Hub 800H (I) – Planned for future rels.

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management
H1.0 SU1	Detailed alarms displayed into NE alarm list and Network Alarm List	Via equipment WebLCT remote launch	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	Availability via equipment WebLCT remote launch

Harmony Hub 800H (II) – Planned for future rels.

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
H1.0 SU1	Fault management	Not supported	Not supported	• Fault management • Performance • Topology data export

Harmony Trunk (I) – Planned for future rels.

Basic FCAPS

Managed Releases	Fault Management	Configuration Management	Inventory Management	Performance Management
4.1 4.2 4.2.3 4.3 4.4	Detailed alarms displayed into NE alarm list and Network Alarm List	Configuration via dedicated DragonView Plug-in	HW and SW Data: • displayed via dedicated DragonView Plug-in • data stored in to inventory log • Data collected in to DragonView Database	G.826 Statistics • Data at 15' and 24h collected into DragonView Database ETSI RSPI • Data at 15' and 24h collected into DragonView Database

Harmony Trunk (II) – Planned for future rels.

Northbound Interfaces

Managed Releases	SNMP Agent	TCOA	OSS/J Data Exporter	NetAct-NV Connector
4.1 4.2 4.2.3 4.3 4.4	Fault management	Not supported	Not supported	• Fault management • Performance • Topology data export