Presentation on
U-NMS
for
ISTS & State Utility Communication Network

Background

Central Electricity Regulatory Commission notified the **CERC**(Communication System for inter-State transmission of electricity) Regulations, 2017, which envisaged **Centralized Supervision System for** quick fault detection and restoration of **ISTS Communication.**

As per CERC notification- CTU shall be the Nodal Agency for implementation of system for centralized supervision for quick fault detection and restoration of ISTS Communication.

Technical standard & Manual of Communication Planning Criteria being finalized by CEA envisage requirement of System for centralized supervision for ISTS Communication.

Guidelines framed by NPC for Availability Calculation of Communication envisage System for centralized supervision for ISTS Communication

Accordingly, POWERGRID has worked out Scheme for implementation of U-NMS System for centralized supervision of Communication network for Southern Region including ISTS & State Utilities.

Present Scenario

- Network Management Systems(NMS) for SDH & PDH for maintenance of Communication System came up as part of different projects like, Unified Load Dispatch and Communication (ULDC), Microwave Replacement Projects (MRP), Fiber Optic Expansion Projects (FEP), Back-up SLDC Projects, various Transmission Projects under turnkey and Reliable Communication Projects. Obviously, the communication infrastructure is being supplied under different projects may not be of same OEM, even though the system architecture, technical specifications are same.

- Supplied NMSs are proprietary in nature / OEM specific and hence the Network Elements such as OLTEs(SDH), OptiMUX / MUX(PDH) are being monitored & managed by same OEMs NMS only. There is no Cross-interoperability between NMS & NEs of different make, though there is a scope for interoperability between different OEM OLTEs at SDH level for E1 & EoS services to some extent.

- There are multiple NMSs for SDH & PDH are available in Southern Region / SLDCs working in isolation. Majority of ISTS Communication nodes implemented by other utilities are not integrated with existing NMSs as they were implemented in different projects.

- Present NMSs were considered with requirement mainly for monitoring and maintenance of implemented Communication Nodes. Whereas CERC (Communication System for inter-State transmission of electricity) Regulations, 2017 provisions are envisaged for ISTS Communication for which existing NMSs are not capable.

- Centralized Management of ISTS Communication in the present scenario needs State of the Art NMS to meet these objectives and hence, Unified Network Management System (U-NMS) at National and Regional level are conceived for managing Communication System.

Proposed U-NMS Scheme

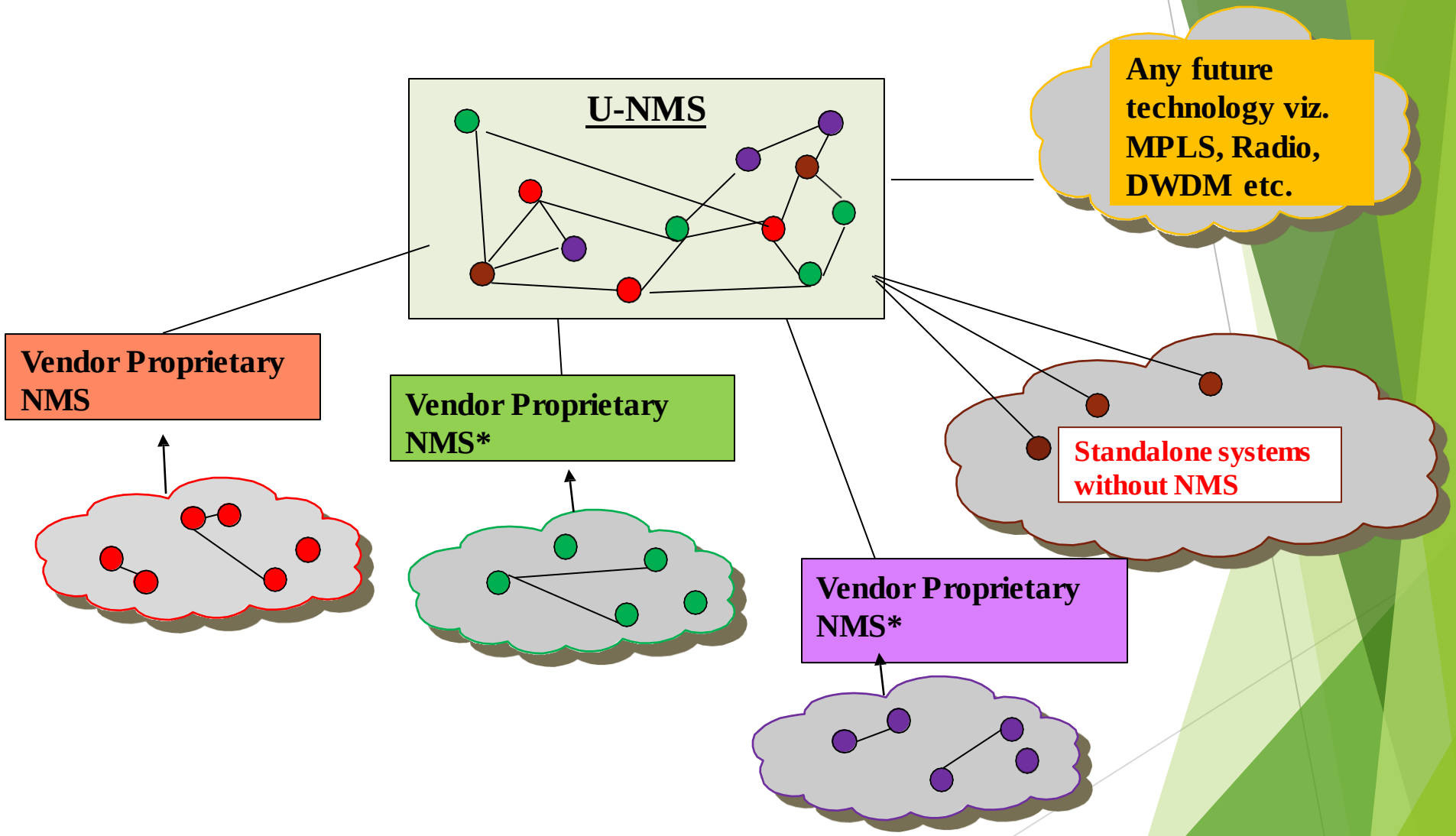
Centralised Management of ISTS Communication System at Regional and National levels by integrating existing NMSs and Network Elements (which are remotely accessible or having standard & open APIs). The U-NMS Scheme shall consist of Centralised Application Server acquiring data of Communication nodes from multiple NMSs in the region as well as from NEs.

The proposed U-NMS shall acquire data directly from existing NMSs of ISTS and State Utility and also from nodes not integrated with existing NMS for all ISTS and all other Utility communication links. The system shall be designed for managing Intra State, ISTS, Inter-Regional Communication Systems for State, Regional and National level respectively.

U-NMS Configuration for National & Regional shall consist of Servers, Storage Devices, VPS, Switches, Routers, Firewall, Remote workstations, Printer, Furniture etc. in dual LAN in Main (High Availability-HA) and Backup configuration to manage ISTS regional, inter-regional and Cross Border communication links.

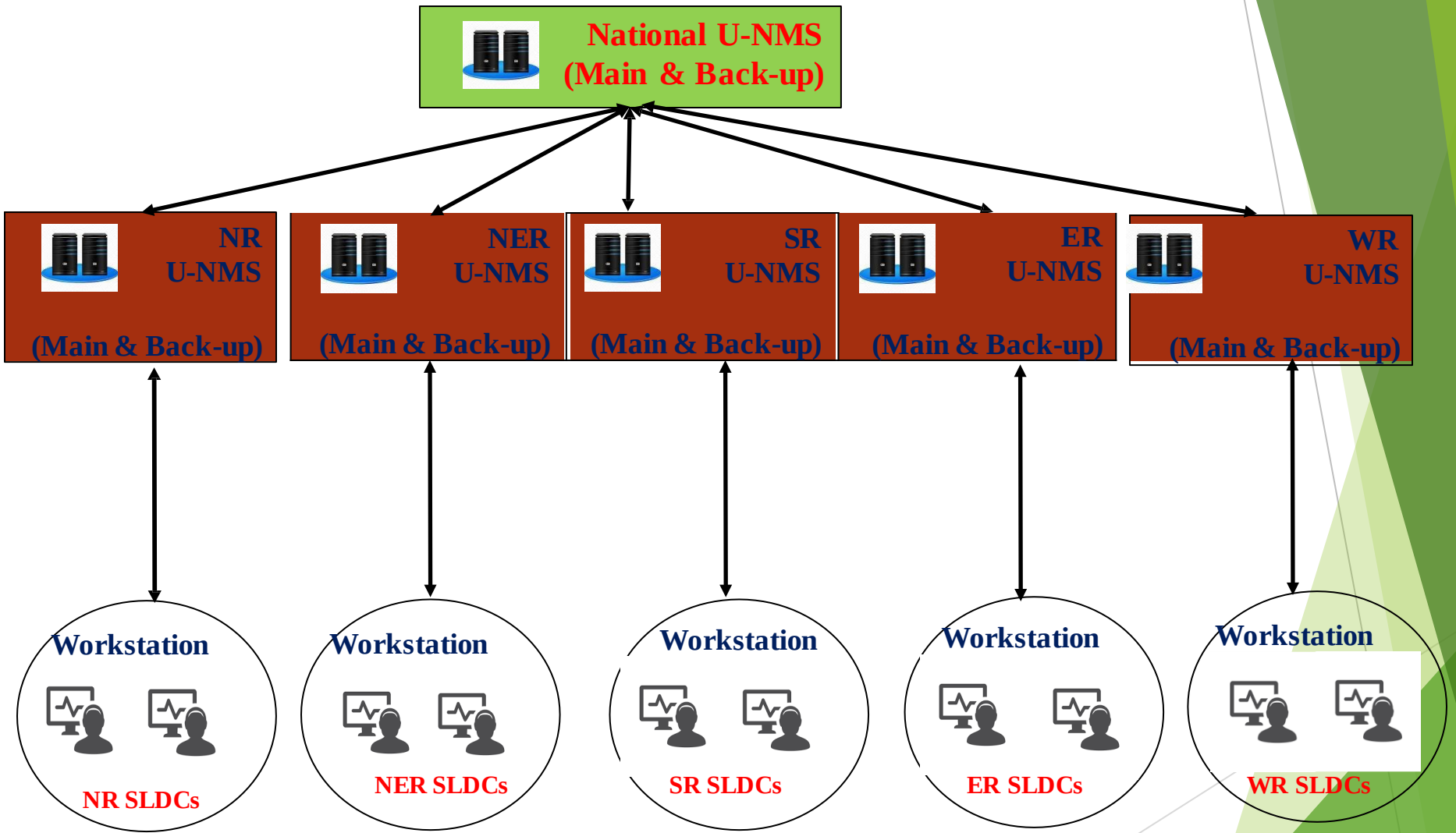
U-NMS Configuration for managing Intra State Communication for SLDCs shall also be considered by providing Remote workstations, etc. with rights to access servers of respective RLDCs to manage their respective Communication Network.

proposed UNMS will manage the network



The proposed UNMS shall be integrated with multiple make NMS and standalone communication equipment to give integrated view of Network and Centralized Supervision.

HIERARCHICAL SET-UP IN THE UNMS



Elements to be Integrated in UNMS

Following is planned to be integrated in proposed UNMS System:

EMSs/NMSs of the existing communication Network of SDH, PDH and MPLS (if any).

Standalone Network Elements (NEs) which are not being managed by any EMS/NMS presently.

Shall also envisages integration of future network expansions including new Transmission Technologies like MPLS-TP, SDN, SDVAN, NFV etc.

Facilities / Right of Access

U-NMS Configuration for SLDCs shall consists of remote workstations, switches, Routers, Firewall with IPS, printers, Furniture, time and system availability display with rights to access servers of respective Regional UNMS centre.

State Utility shall have a topological view of all networks including ISTS communication network within their state while they will have control of entire State Communication network .

Regional (ISTS) UNMS consoles shall have a topological view of entire regional network including ISTS & State Communication network but control of only ISTS network of the region.

National UNMS shall have topological view of pan India network including ISTS and State communication network. Further, control shall be possible only for inter-regional links with National UNMS.

PRESENT SYSTEM (Constraints / Challenges)

ints in the existing system	Operational challenges
e EMSs/NMSs and lone NEs	- Centralized supervision and centralized configuration of services are not possible - Auto generation of the communication system availability not possible (This is an expected requirement of CERC regulation) - Difficulties in system planning because of non-visibility of the bandwidth wise availability
vision of the centralized se and data retention for 3	- This is not in line with the present regulatory requirements
NMSs were considered quirement mainly for ring and maintenance of nented Communication Nodes	- Predictive analysis or preventive maintenance is not possible - Inventory management is not possible which has direct impact on time and resources

Major Benefits of the proposed UNMS

- Shall meet the present and envisaged regulatory requirements
- Visualisation of all ISTS and State Utility Communication Nodes in Single NMS facilitating effective network monitoring and reporting.
- Centralized provisioning of data and voice Services.
- Advance features such as availability calculations, automated fault report generation
- Assets monitoring and effective Inventory Management.
- Support for preventive maintenance and analytics for predictive analysis
- Data retention for 02 calendar years plus the current year for all interfaces in the network etc.
- Facilitate reliable and resilience network.
- Services through Backup UNMS in case Main UNMS fails because of system issues or natural calamities