



## Cisco IP Solution Center (ISC)



A Family of Intelligent Network Management Applications  
for Managing MPLS and Carrier Ethernet Networks

# Agenda

- Introduction
- Cisco Service Provider IP Network Management Portfolio View
- MPLS VPN and Carrier Ethernet
- Monitoring and Assurance
  - OSS Integration
- MPLS Diagnostics
- MPLS Traffic Engineering
- Summary



# Meeting Service Provider Challenges

## Enabling the Transition



### Services

- Differentiation
- Loyalty
- Revenue



### Efficiencies

- OpEx
- CapEx
- Profits



### Control

- Service
- Network
- Business

### IP

- Intelligence
- Flexibility
- Adaptability

# Cisco Service Provider Strategy

## The Most Complete Partner for SP Success

### Deploy Services

Layer existing and new services for revenue and profit growth, faster time to market

### Build Networks

Intelligent, extensible, and efficient packet infrastructures for lower TCO

### Accelerate Demand

Accelerate demand by connecting consumers, SMBs, and enterprises to SP services

### Optimize Business

Provide domain expertise to support business and network transitions and improve operational efficiencies

**Cisco IP/MPLS Solutions**

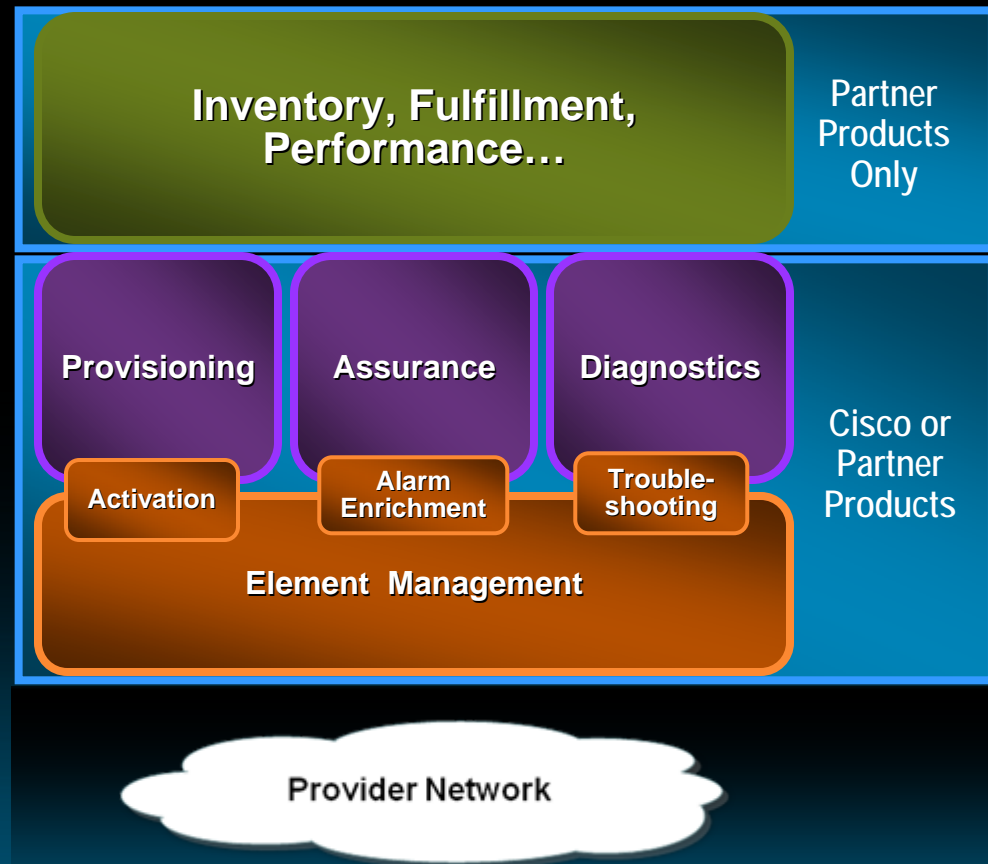
# Agenda

- Cisco Service Provider  
IP Network Management  
Portfolio View



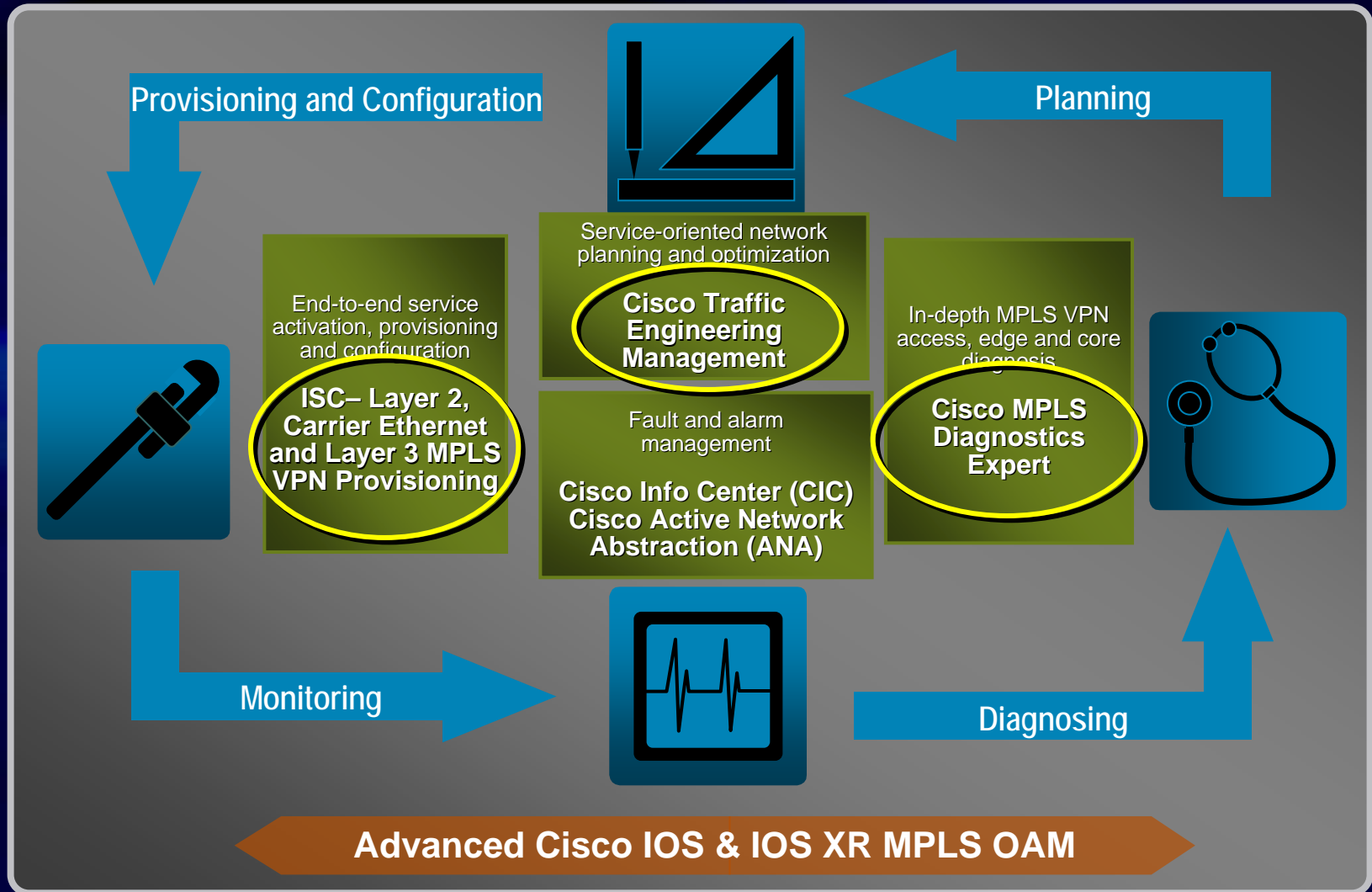
# Cisco Service Provider IP Network Management Portfolio and Partner View

- Cisco Portfolio
  - EMS with service-enriched interfaces
  - Carrier-proven provisioning
  - End-to-end service assurance
  - Unique automated diagnostics
- Solution Architecture
  - Designed & tested with Cisco® hardware
  - Modular architecture
  - Cisco or partner component choice
  - Rich interfaces with proven integrations
  - Cisco or partner delivery services



# Applications for IP/MPLS Business Services

A Suite of Network Management Applications  
for Managing MPLS and Carrier Ethernet Services



# Agenda

- **ISC L3 VPN and Carrier Ethernet Provisioning**

Provisioning & Configuration



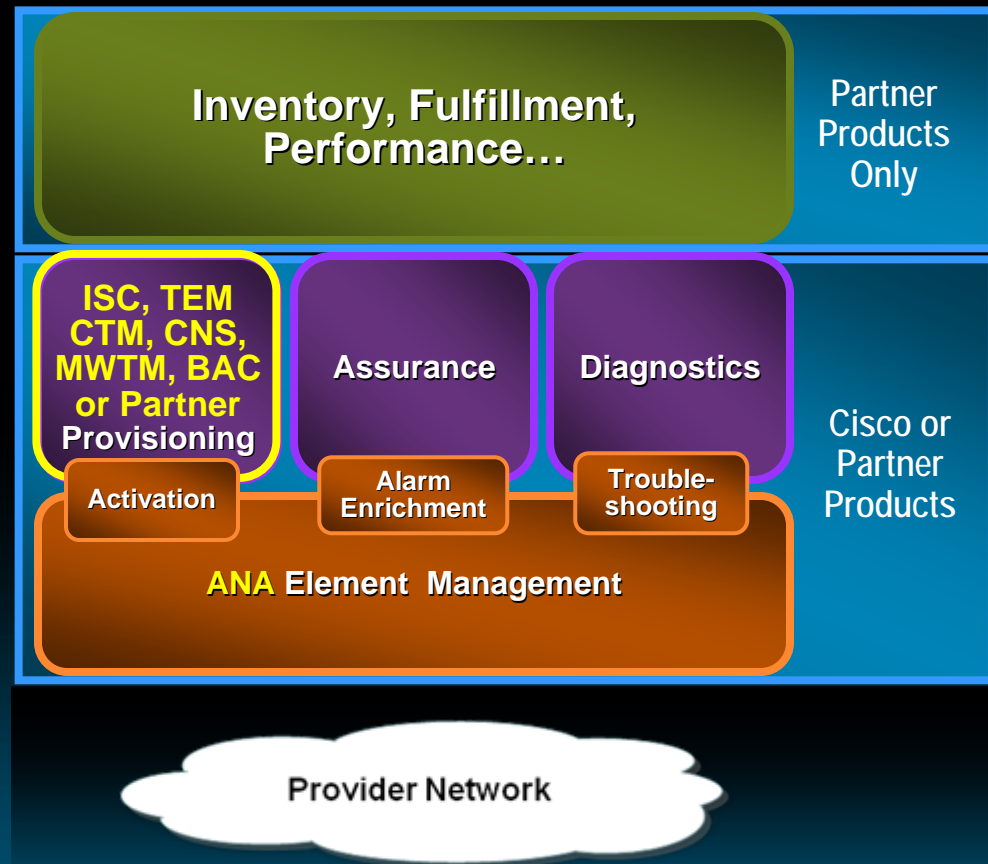
End-to-end service  
activation, provisioning  
and configuration

**ISC– Layer 2,  
Carrier Ethernet  
and Layer 3  
MPLS VPN  
Provisioning**



# Cisco Portfolio for Provisioning Management

- **IP Solution Center Provisioning**
  - L3 MPLS VPN
  - L2, Carrier Ethernet
  - Traffic engineering
- **ANA Activation**
  - Customizable activation methods
  - Abstracted device layer for provisioning
  - Integration with partner products
- **Other Domain-Specific Provisioning Products**
  - CTM (optical)
  - MWTM (mobile & cell site routers)
  - BAC (broadband, wireless, femtocell CPE)



# Cisco ISC Provisioning Overview

- Designs and Assigns
- Robust Provisioning flow
- Wide Service Configuration Support
- Automatic Management of Logical Resources
- Comprehensive Platform, IOS, and IOS XR Feature Support

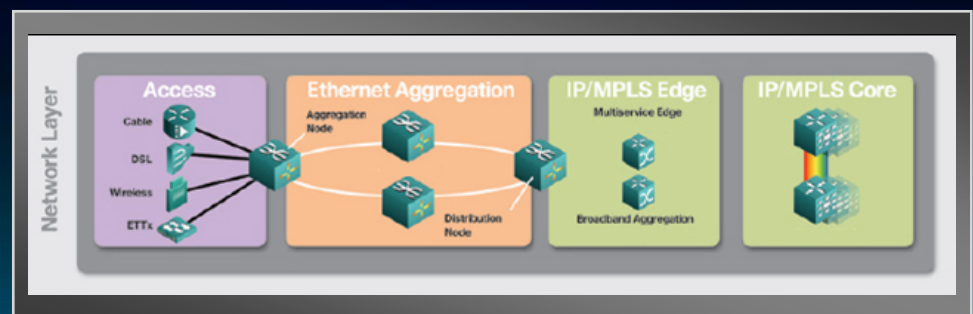
The screenshot shows the Cisco IP Solution Center interface for editing a FlexUNI(EVC) Service Request. The page includes a navigation menu with tabs for Service Inventory, Service Design, Monitoring, Diagnostics, and Administration. The main content area is titled 'FlexUNI(EVC) Service Request Editor' and contains several sections:

- Service Request Details:** Fields for Job ID (New), SR ID, Policy (LINE), VPIB (LINE), AutoPick VC ID (checked), VC ID, Pseudowire Redundancy, Backup PW VC ID, and Configure Bridge Domain.
- Direct Connect Links (2 Links):** A table listing two links with columns for #, N-PE, UNI, Link Attributes, and FlexUNI(EVC).

#	N-PE	UNI	Link Attributes	FlexUNI(EVC)
1	net1-7009-dst1	TenGigabitEthernet2/0/1	Edit	<input checked="" type="checkbox"/>
2	net2-7009-dst1	TenGigabitEthernet3/0/1	Edit	<input checked="" type="checkbox"/>
- Links with L2 Access Nodes (1 Links):** A table listing one link with columns for #, U-PE/PE-AGG, UNI, Circuit Details, Link Attributes, and FlexUNI(EVC).

#	U-PE/PE-AGG	UNI	Circuit Details	Link Attributes	FlexUNI(EVC)
1	net1-3420-acc3	GigabitEthernet0/2	net1-7009-agg1_OigabitEthernet1.0/1	Edit	<input checked="" type="checkbox"/>

Buttons for Template, Save, and Cancel are located at the bottom right of the interface.



# Agenda

- **Monitoring and Assurance**  
OSS integrations

Fault and alarm  
management

**Cisco Info Center (CIC)**  
**Cisco Active Network  
Abstraction (ANA)**

Monitoring



# Cisco Portfolio for Assurance Management

- **ANA EMS**

- Device and service alarm reduction, enrichment
  - Exposed via NBI & SNMP
  - Integrations: CIC, partner

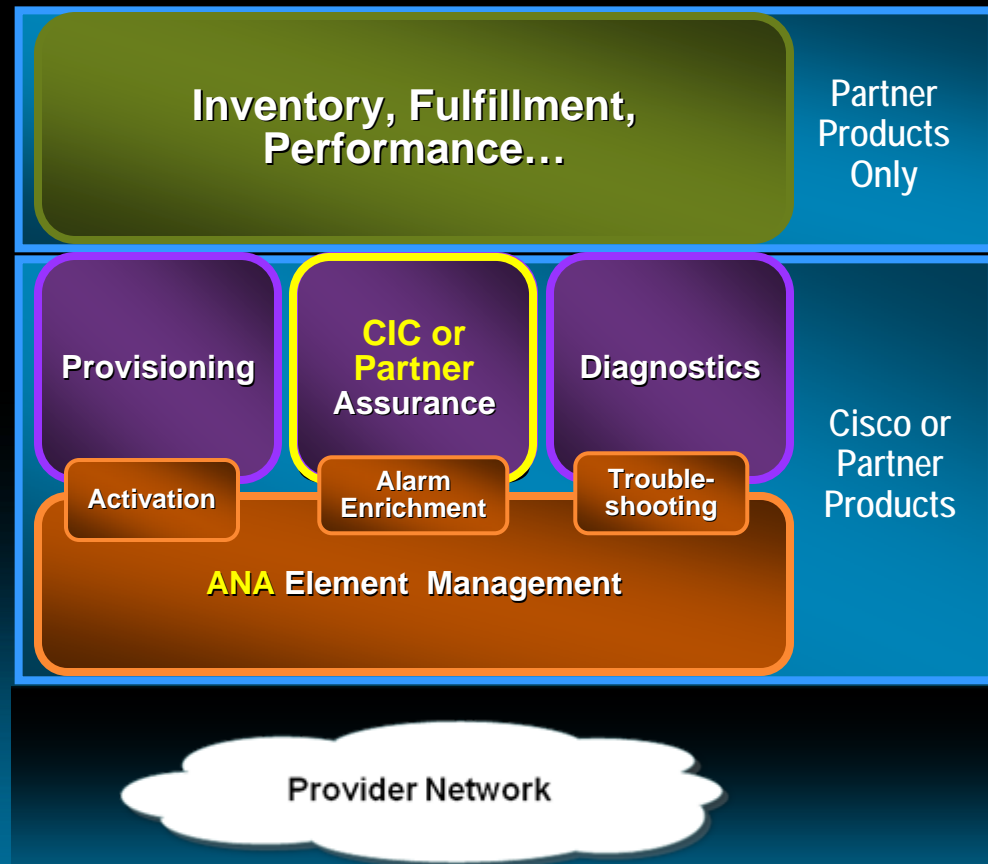
- **Cisco Info Center (CIC / NetCool)**

- Consume ANA-enriched events
  - Drill down to ANA troubleshooting
  - Additional advanced correlations provided through service contract

- **Combined Assurance and Provisioning Solution**

- **ISC integration with CIC for alarm and trouble ticket enrichment**

- **Cisco NCM available to track all changes to the network configuration**



# Agenda

- **MPLS Diagnostics Expert (MDE)**

In-depth MPLS VPN  
access, edge and core  
diagnosis

**Cisco MPLS  
Diagnostics  
Expert**



Diagnosing

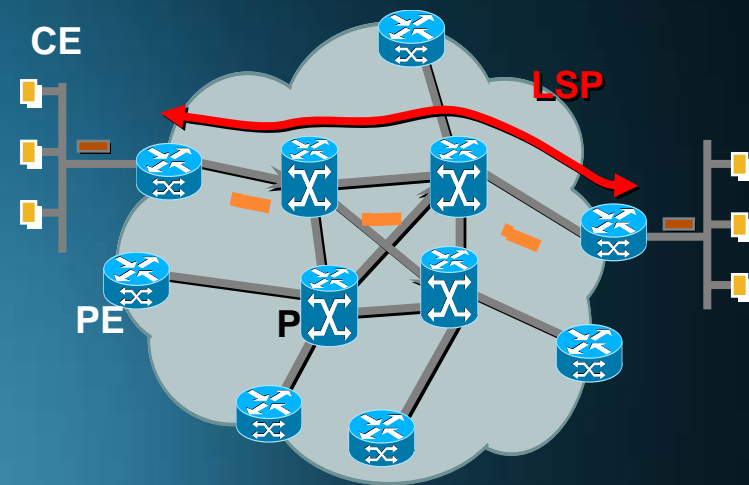


# The Business Problem: Overview

- Outage detection
- Complexity of IP/MPLS networks – e.g., *LSP Black holes* in MPLS core
- Network configuration changes ... typically cause 50% of network outages
- Access circuit issues – typically 90% of customer support calls
- Customer network problems – all too often “MPLS VPN outage” root cause
- Need for MPLS skills on the helpdesk
- NOC organizational “hand-overs”

Front-line helpdesk -> Level 2 support -> Level 3 support/design engineering)

**Real-life customer problem ... Deleted VPNV4 address family on route reflector ... took hours to find and diagnose**



**Real-life customer problem ... Inconsistency between MPLS forwarding table on CPU and line card ... several hours outage**

# Cisco MPLS Diagnostics Expert (MDE) - Product Overview



- **Award winning**, automated troubleshooting and diagnosis of MPLS VPN problems - 80/20 rule
- Diagnoses problems in MPLS VPN core, edge, **and** access ... **and** can isolate problems to the end-customer network!
- Reduces MPLS outages from hours to minutes using **MPLS VPN Failure Knowledge Base** developed by NMTG – with TAC and ITD support
- Diagnoses complex MPLS core LSP “black holes” via Cisco IOS MPLS OAM support – LSP ping and traceroute in mixed IOS/IOS-XR networks
- Usable by, and empowers, the NOC helpdesk
- Accelerates NOC organizational handover via detailed test log – all steps logged
- Unique Cisco capability, **complementary** to existing, traditional fault NMSs
- Deployable with customers who **don't** use ISC as well as those who do
- Comprehensive patent filed on MDE algorithms

MPLS VPN Connectivity Verification Configuration

Local Site

Remote Site

PE Device Name: New\_York\_PE1

PE Access Circuit Interface: Serial3/0.101

CE Access Circuit Interface IP Address\*: 150.1.1.2

Customer Device IP Address:

Remote Site

PE Device Name: Singapore\_PE7

PE Access Circuit Interface: Serial3/0

CE Access Circuit Interface IP Address\*: 150.1.2.2

Customer Device IP Address:

Populate from VRF

Populate from VRF

Populate from VPN

OK

Clear

VPN Connectivity Verification

Customer: None

Reactive Test Results

VPN Connectivity Test Result

Customer Device 144.254.118.192

CE 10.51.20.2

PE Untagged/20 POS2/0 POS10/0 london-pe

P 20/25 POS2/0 core-1

P 25/30 GigE20/0 core-2

Customer Device 144.254.118.190

View: Test Details Test Log

Summary: No VPN connectivity within VPN1 on london-pe to 10.52.21.2

Possible Cause(s): LSP broken, No LFIB entry on core-2 for prefix: 144.254.117.190

Recommended Action: 1. Clear IP route for prefix: 144.254.117.190  
2. Check LSP session  
3. Check LSP/RFC inconsistency on each previous hop  
4. Check for duplicate loopbacks in path

WARNING: Clearing route may be service affecting operation

Advanced Re-test Cancel

# Agenda

- **MPLS Traffic Engineering**

## Provisioning



Service-oriented network  
planning and optimization

**Cisco Traffic  
Engineering  
Management**



# Key Challenges in Traffic Engineering of MPLS Networks



## Business Challenges

- Traffic management on IP/MPLS Core networks
- Predictable routing for Ethernet business services
- Bandwidth protection for data collection and signaling traffic in mobile IP core
- Fast restoration of L2VPN services
- Matching of business services to available QoS resources in converged NG networks
- Delivery of hard bandwidth guarantees

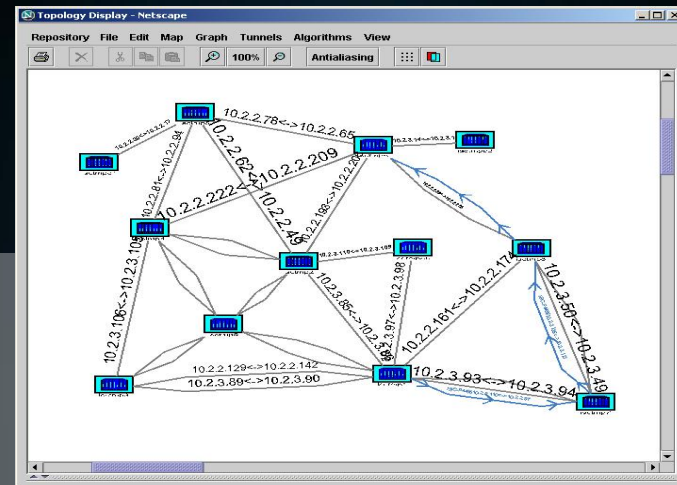


## Management Needs

- Comprehensive user interface for reducing the complexity of TE technology
- Error-free provisioning of TE tunnels and traffic admission
- TE planning based on actual network topology
- Fast restoration in the event of element failure (sub-50 ms for VoIP)
- Optimization of network utilization
- Large-scale TE resource management and bulk TE tunnel provisioning
- Transparency over ongoing network changes... new features and new IOS or IOS XR releases

# The Features and Benefits of ISC Traffic Engineering Manager (TEM)

- Discover, visualise and audit MPLS-TE tunnels
- Protect the network against failure
- Optimize network utilization
- Guarantee bandwidth for QoS-sensitive applications and premium services
- Enable fast service recovery and restoration



The screenshot shows the "Traffic Engineering Management Services" web interface. At the top, there is a search bar for "TE Provider Name" with a "Select" button. Below this, the interface is divided into two columns: "Service Request Elements" and "Service Request Forms".

Service Request Elements	Service Request Forms
<b>TE Providers</b> View TE Providers	<b>Create Managed TE Tunnel</b> Create or Edit SR for Managed Traffic Engineering Tunnels
<b>TE Topology</b> View TE Topology Applet	<b>Create Unmanaged TE Tunnel</b> Create or Edit SR for Unmanaged Traffic Engineering Tunnels
<b>TE Nodes</b> View TE Nodes	<b>Create TE Backup Tunnel</b> Create or Edit SR for Traffic Engineering Backup Tunnels
<b>TE Links</b> View TE Links	<b>TE Traffic Admission</b> Assign Traffic to Traffic Engineered Tunnels
<b>TE SRLGs</b> Manage TE Shared Risk Link Groups	
<b>TE Explicit Paths</b> Manage TE Explicit Paths	
<b>TE Protected Elements</b> Manage Protection of Network Elements	

# Agenda

- Summary



# IP Solution Center: Applications Summary

Cisco IP Solution Center is a family of intelligent network management applications for planning, provisioning, and troubleshooting MPLS and Carrier Ethernet networks.

## **ISC:MPLS**

simplifies, integrates, and automates the management of L3 VPN networks.

## **ISC:L2 VPN and Carrier Ethernet**

simplify, integrate, and automate the management of L2 VPN and Carrier Ethernet/ATM/Frame Relay networks.

**MDE** is an automated, workflow-based network management application that troubleshoots and diagnoses problems in MPLS VPNs.

## **ISC:TEM**

leverages MPLS-TE to enable network convergence and offers advanced MPLS-TE management functionality, including network optimization and bandwidth protection.

# For More Information

- For more information about the Cisco IP Solution Center and its family of intelligent network management applications, visit the following Cisco Connections Online location or contact your local account representative
- Cisco IP Solution Center Overview:  
<http://www.cisco.com/go/isc>
- Cisco MPLS Diagnostics Expert Overview:  
<http://www.cisco.com/go/mde>



