

# **SAN Extension Services Impact on Ethernet and MPLS**

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# SAN Extension Services - Agenda

## **SAN Extension Trends for Business Customers**

Opportunity for Service Providers

Leveraging MPLS and Ethernet for SAN Extension

Case Study: i-SAN Service - Orange Business Service

# SAN Extension for Business Customers

## IT Managers Roles are increasingly mission critical

- More emphasis on mission critical Enterprise functions
- Business Continuity and Disaster Recovery planning is a key requirement today

## Key Trends in the Space

- Sarbanes-Oxley regulations impose to large companies to secure their internal data
- Large Companies may manage their own SAN network or have a managed service from a service provider.
- Increasingly demand that their suppliers and partners have robust disaster recovery and business continuity processes.

# SAN Market Dynamics

- SAN market, traditionally has been dominated by Enterprise oriented SAN manufacturers (Brocade, McData, InRange, Qlogic, CNT...)
- Large Enterprises continued to be the key target market.
- SAN market has recently gone through consolidation. Increasing focus on SAN solution for small and medium businesses.
- Networking vendors are increasingly partnering and providing SAN extension solutions for large Enterprises as well as Service providers.

**Large Enterprise SANs**



**SMB SANs**

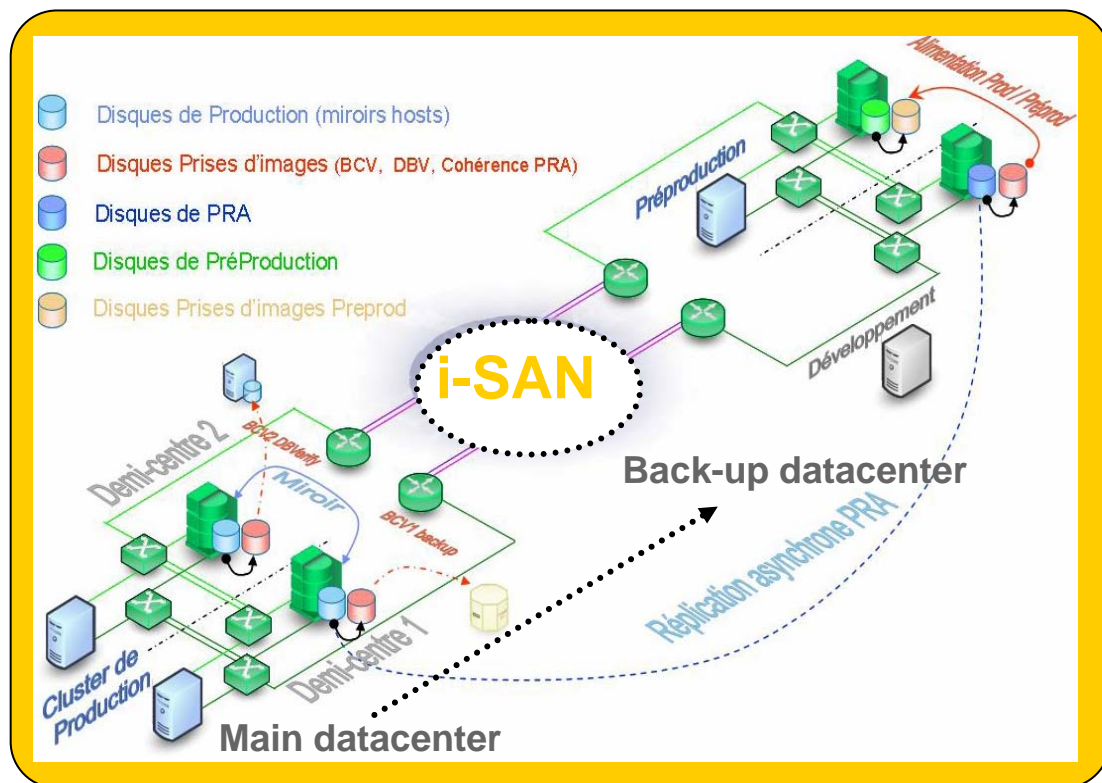
# SAN Extension Technical Developments

- SAN technologies are increasingly accessible to SMB market
- New equipment needs lower technical competence and offer simple plug and play SAN solutions
- The ANSI/T11 Fiber Channel (FC) standards are widely implemented on SAN networks
- New protocols defined for Fiber Channel Data over Ethernet or IP backbone
  - FCIP : Fiber Channel over IP
  - iFCP : Internet Fiber Channel Protocol

# SAN Extension Service

## Bundled FC/IP Gateway with Ethernet Service

- Enterprises who build two or more geographically dispersed data centers with SAN in each of them needs **specific interconnections**.
- **SAN Extension** offers the opportunity to interconnect by FC links two SAN islands with very low delays and to support over **long distances up to 1000 km**.



### Customer Benefits

- Disaster recovery is available
- Business continuity allows you an access to data on 24 x 7 basis
- Speed up the response time of some of your critical applications
- Distribute contents (ie video) to the remote sites from a central library
- Consolidate your sophisticated IT equipment such as storages and database to data centers

# SAN Extension Services - Agenda

SAN Extension Trends for Business Customers

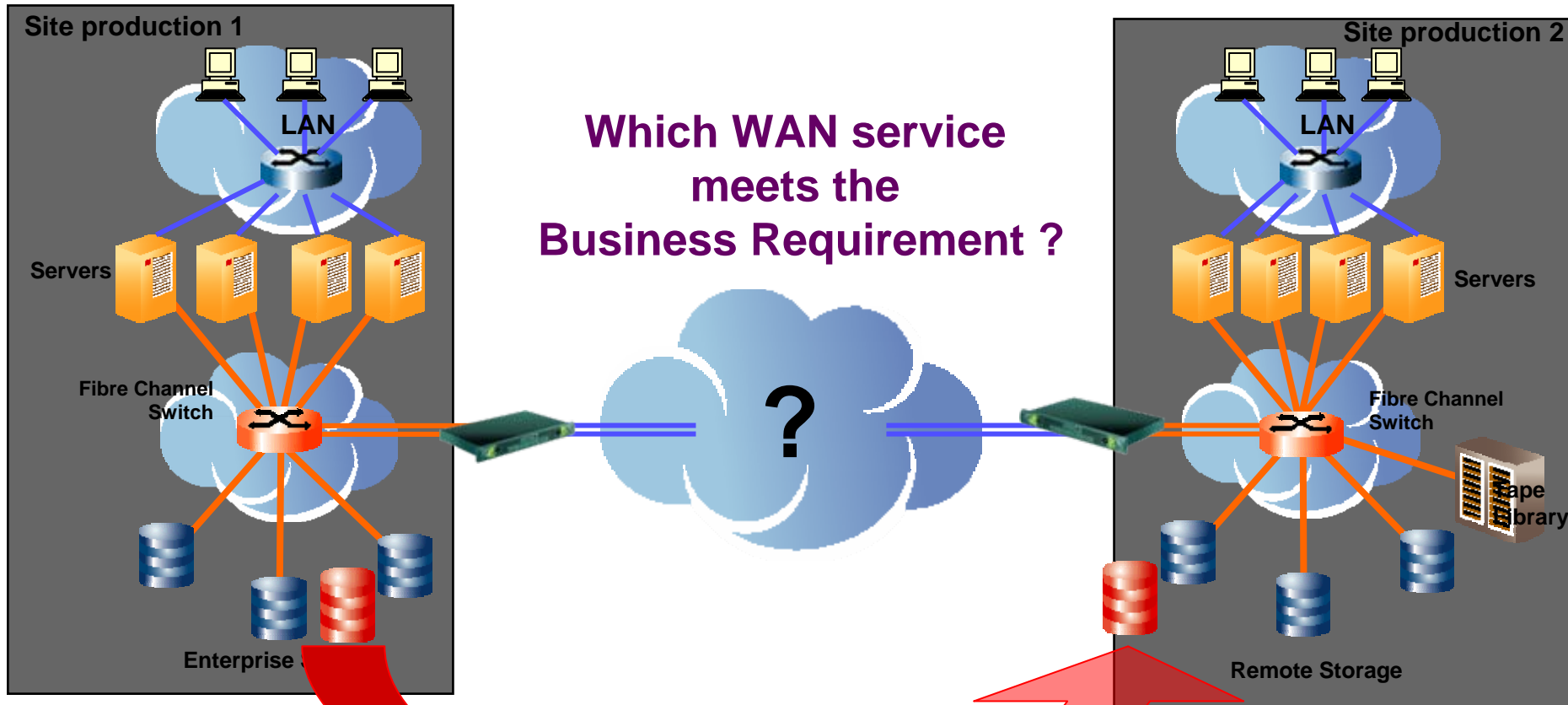
**Opportunity for Service Providers**

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# SAN Extension Opportunity

**Example: Rack and disk mirroring between 2 production sites.**





# SAN Extension Over Ethernet: A New Service

## Strategic Response to the Enterprise Requirements:

- Data centralisation at a main Datacenter;
- Real time data copy on the backup Datacenter ;
- Business Continuity in case of primary Datacenter crash ;

## Operational Characteristics :

- Increase the **geographical coverage for Disaster Recovery Plan**
- Get rid of the **distances** (up to 1000km) of existing solutions
- Opportunity for a differentiated bundled solution for Enterprise needs :
  - Customer Traffic classification for differentiated services (SAN, LAN-2-LAN, VoIP, IP VPN, Internet access)
- Bind **flexibility & high level of performance** :
  - interconnection of high speed SAN,
  - Flexible bandwidth and high speed connection,
  - SAN with guaranteed SLA (bandwidth, latency, gig...)

# SAN Extension Complements L2 Ethernet Services

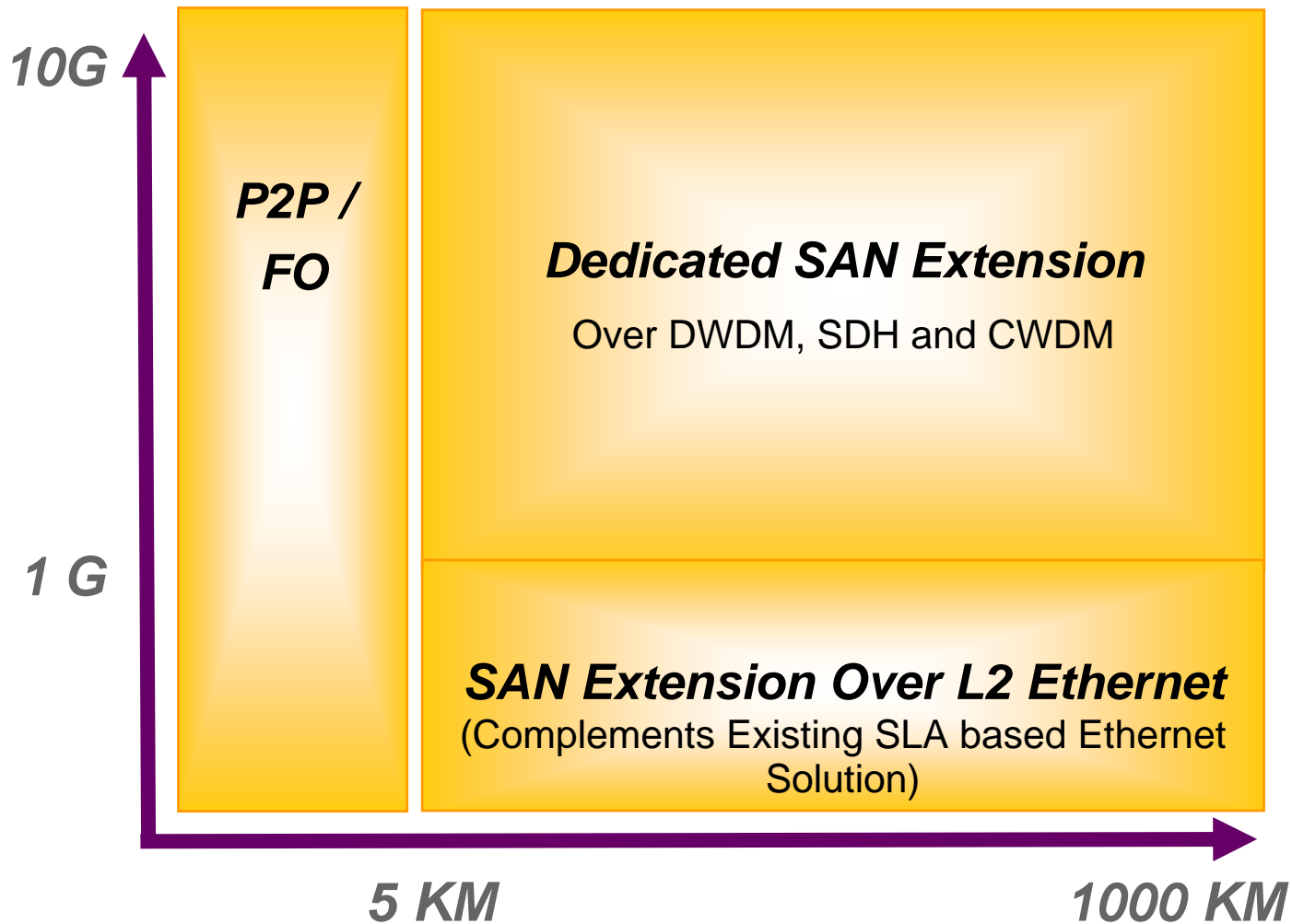
## Common Infrastructure

- Shared access infrastructure and backbone for MAN and SAN interconnection
- Shared and flexible operations infrastructure
  - after sales services, operations, supervision, contract, billing

## Common SLAs

- SAN Extension service can have the same SLA attributes defined by the L2 Ethernet service
- Common security SLAs (standard, secure, very secure)
- Ability to Isolate SAN data (dedicated connection)
- SLA commitments of performance

# SAN Extension Solutions : Positioning Across Multiple Technology Platforms



# SAN Extension Services

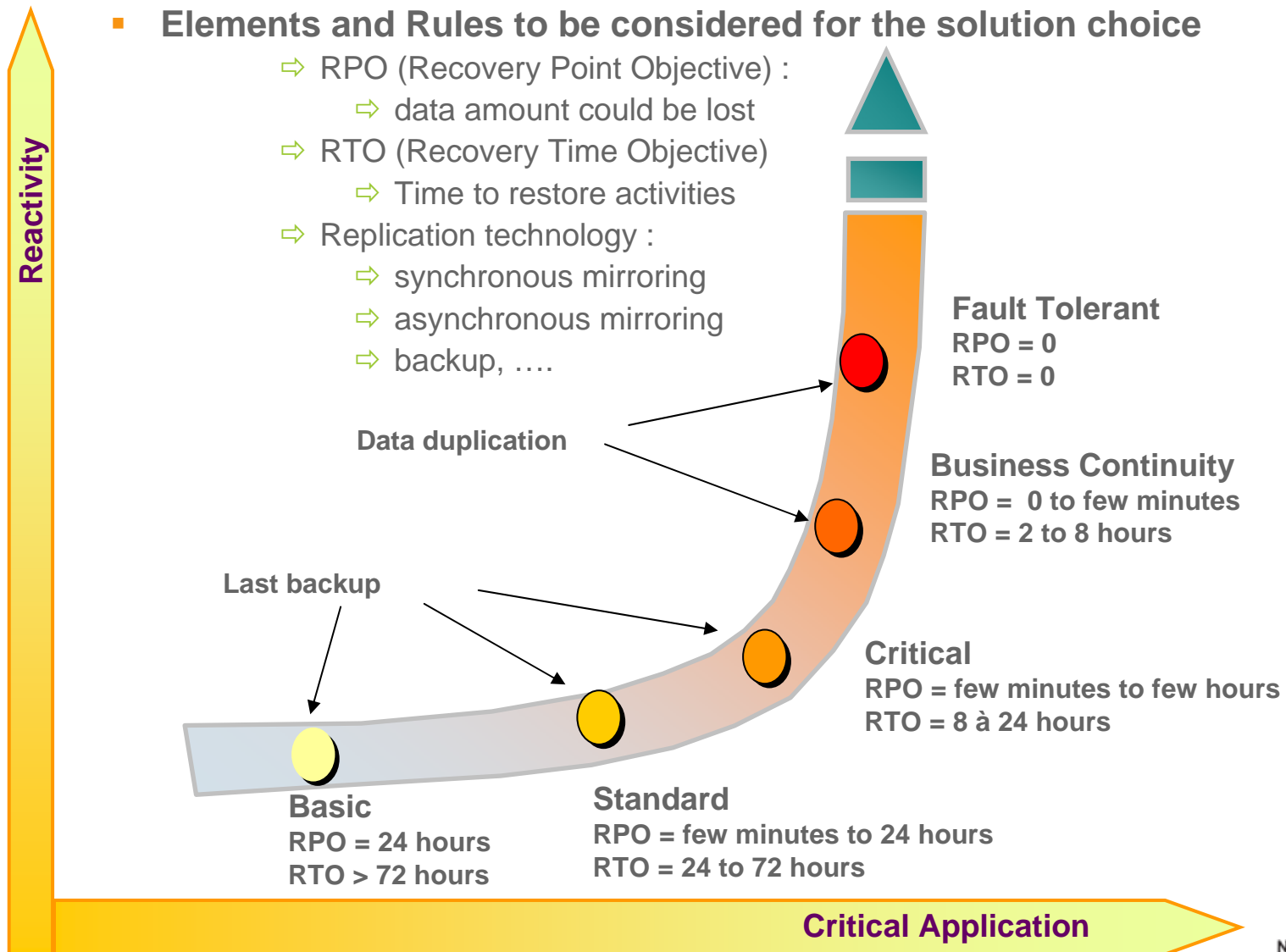
SAN Extension Trends for Business Customers

Opportunity for Service Providers

**Leveraging MPLS and Ethernet for SAN Extension**

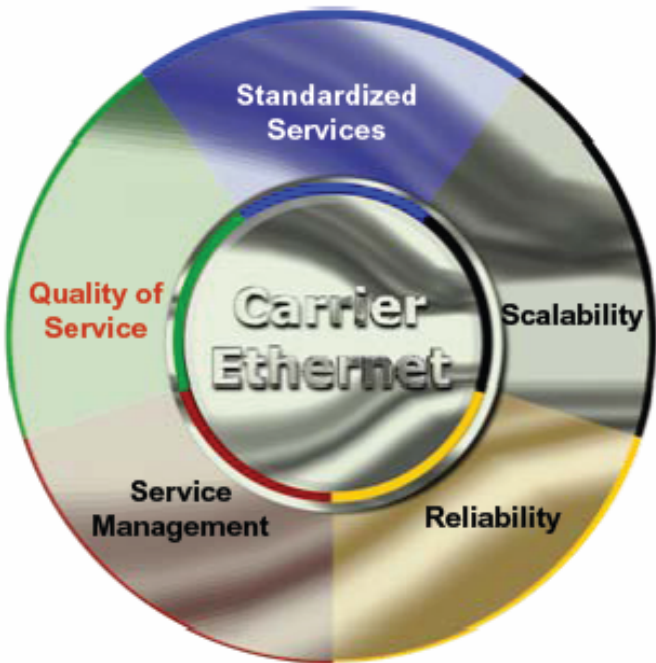
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# SAN Extension - Availability Objectives



# Leverage Existing Ethernet Service for SAN Extension

- Ethernet Service differentiation by Carrier Ethernet attributes



Source: Metro Ethernet Forum

Application Type	Characteristics	Performance SLA
SAN	Critical data applications for SAN-to-SAN interconnexion	RTT : 5ms Jitter : 0,5ms Loss : $10^{-4}$
Real Time & Video	Real-time data & Video applications	RTT : 10ms Jitter : 2ms Loss : $10^{-3}$
VoIP	Real-time IP telephony or IP video applications	RTT : 10ms Jitter : 2ms Loss : $10^{-3}$
Data	Standard LAN-to-LAN interconnexion	RTT : 10ms Jitter : ND Loss : $5 \cdot 10^{-3}$

# SAN Extension - Service Attributes

## **SAN Extension Attributes leverage Carrier-Ethernet solution benefits**

- Guaranteed bandwidth with no packet loss
- Strict low-delay and jitter (no MAC learning)
- No frame re-ordering problems
- Sub-50mSec protection
- End-to-end network and Service management
- SLA performance monitoring with ITU-T OA&M
- Strict traffic segregation
- Flexibility

## **Increase revenue by bundling VPN services with SAN**

- Full Datacenter offer

## **Deliver longer distance SAN service compared with DWDM for lower cost and better network flexibility**

# i-SAN monitoring : real time performance monitoring via web customer site



**SAN connexions performance monitoring**

- RTT
- Packet Loss
- Jitter



**Bandwidth monitoring of SAN connexions**

Interface	Statut	Adresse IP	Adresse MAC	Adresse VLAN
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000
PA_1000_1000_1000_1000	UP	10.10.10.10	00:00:00:00:00:00	1000

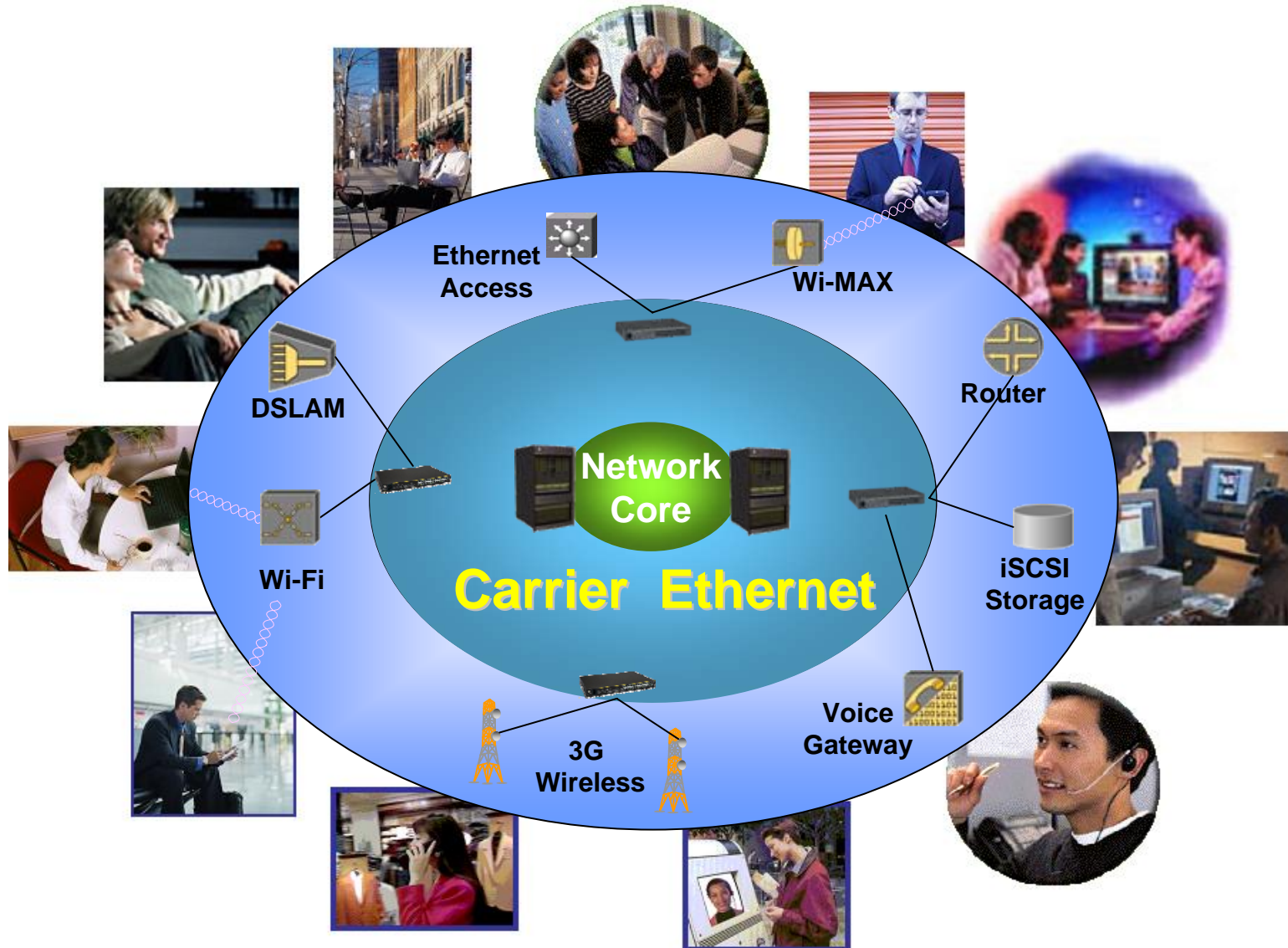
**Ports & interfaces status**

<https://sopranegbe.francetelecom.com/PortalSE/Soprane>





# Carrier Ethernet Extends to Mission Critical SAN Extension Services



# SAN Extension Services

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**Case Study: i-SAN Service - Orange Business Service**



Business  
Services

# i-SAN by Orange Business Services



# i-SAN Evolved from Existing MAN Ethernet Service

MAN Ethernet is a high bit rate LAN interconnection service launched in 2005 by Orange Business Services

- Access bitrate : 100Mb, 1Gb, 2x1Gb Ethernet
- Support for level 2 (Ethernet) and level 3 services (Internet, IP VPN)
- Large geographical coverage (metro 16 main cities, and national)
- Enterprise market : SMB / Large companies
- High growth

i-SAN = additional service for MAN Ethernet to provide SAN interconnection

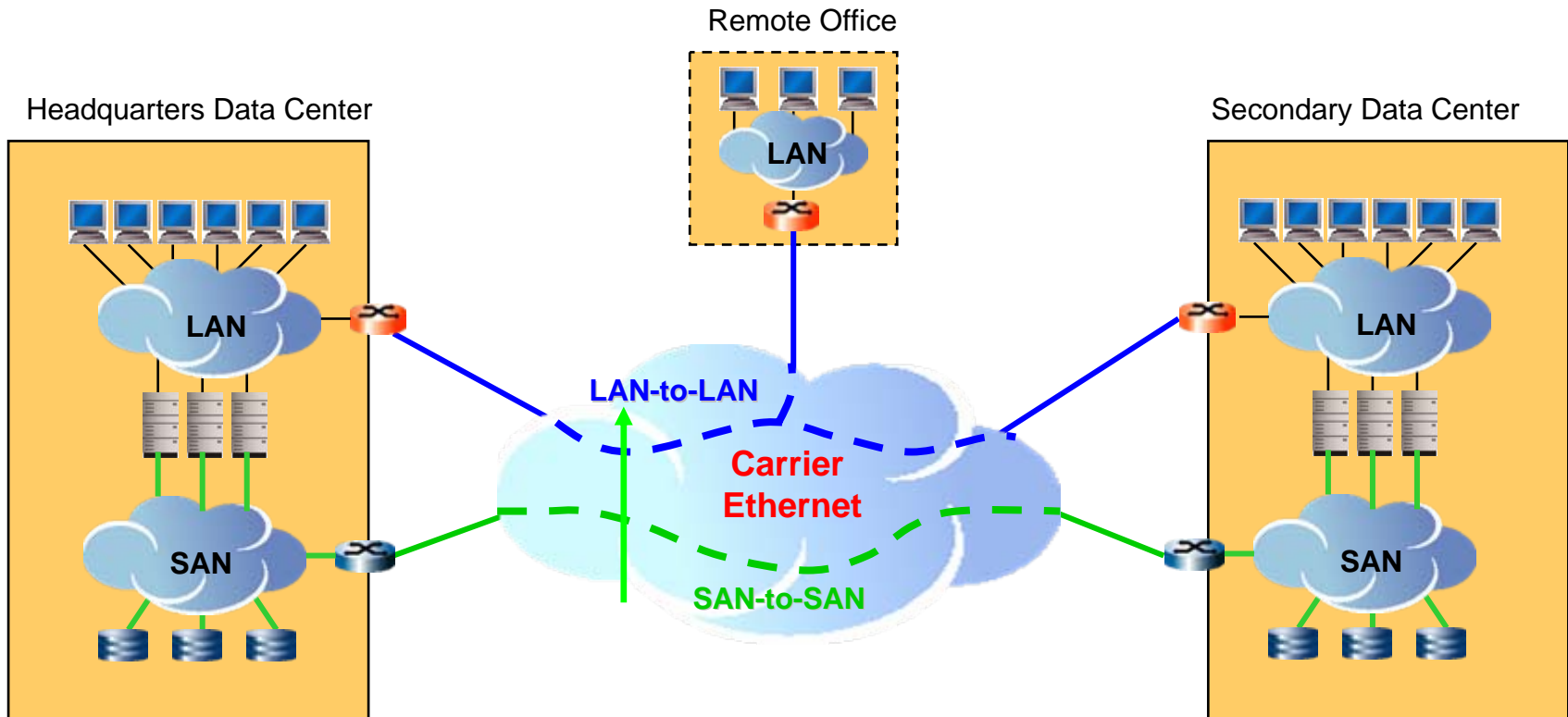
- Fiber Channel interface : FC100, FC100/FC200
- Completely integrated into the network solution (operating, supervision, maintenance)
- Pilot customer in 2006
- Commercial service launched in late 2007



Business  
Services



# i-SAN Service Topology



- SAN connection : logical support
- i-SAN option : leverages the existing MAN/LAN transport infrastructure

# i-SAN service advantages

## Price advantages

- Benefits from very competitive price of the MAN Ethernet Network
- To share backbone infrastructure for MAN and SAN interconnection

## Flexibility

- Benefits of the high qualities of the MAN Ethernet network
  - Bandwidth change, addition / cancellation client site
  - Multiple topologies proposed like MAN Ethernet solution (P2P, M2P and any to any )
- Geographic coverage (IdF region + 15 cities)
- Inter Man solution – national coverage

## Integrated Service

- Single after-sales service, including SAN and LAN interconnection

## Performances

- No network distance limitation : tested until 5000km (depending only on the client application constraint)
- Commitments of performance (SLA)

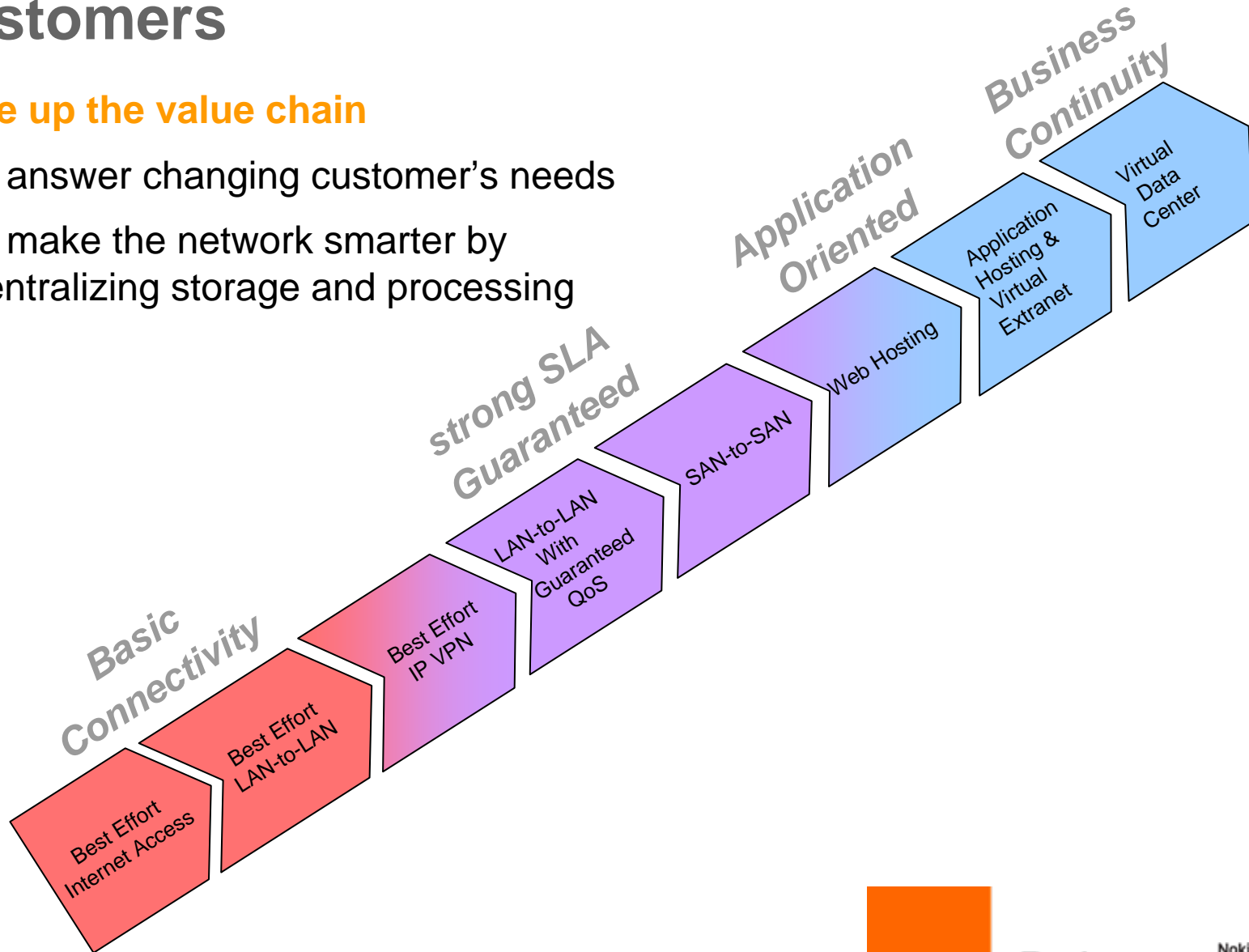
## High Availability

- Network failures do not perturb local SAN traffic

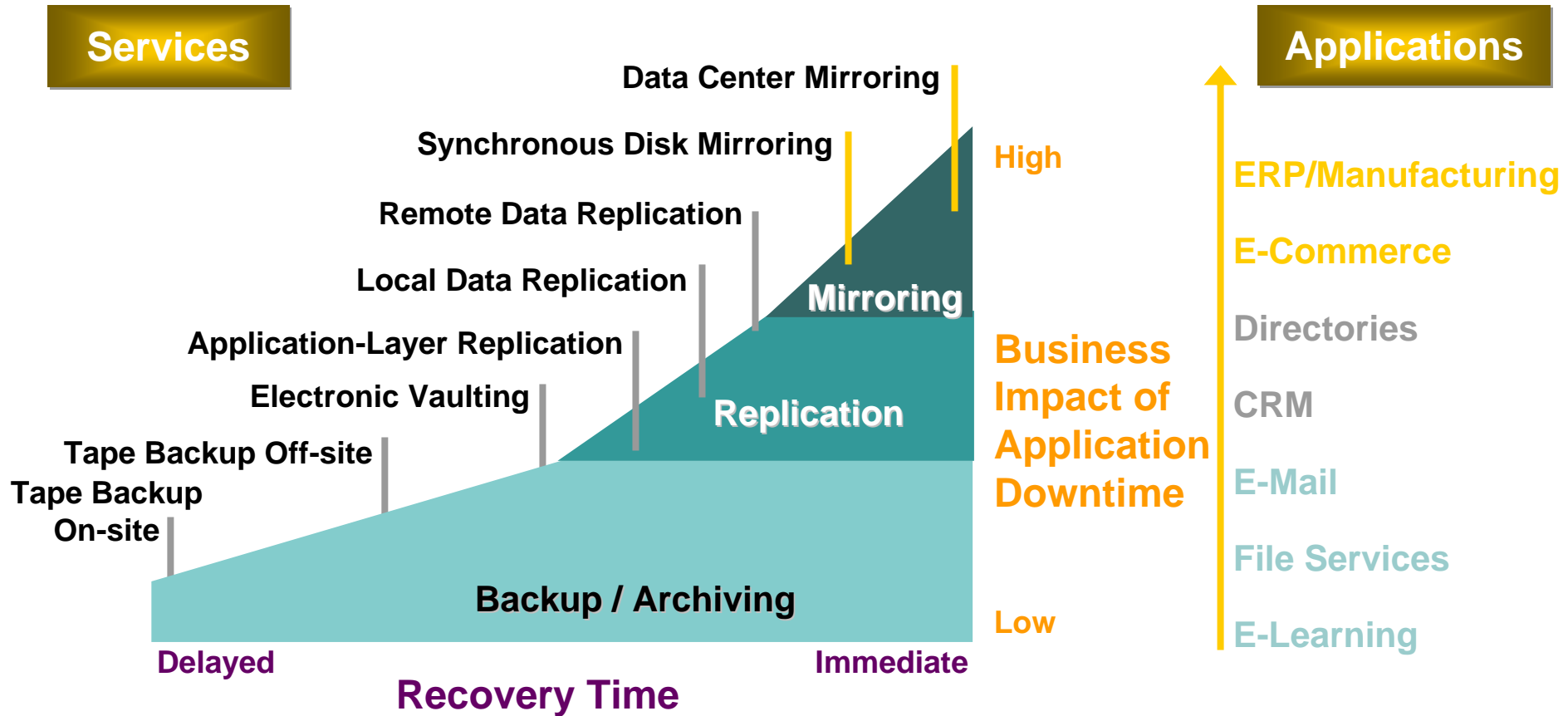
# i-SAN service - Higher value service for Business Customers

## Ride up the value chain

- to answer changing customer's needs
- to make the network smarter by centralizing storage and processing



# Applications Supported by SAN Extension Services



➤ Protection and Hard SLAs Are Critical



# i-SAN Service Summary



Take advantage of MAN Ethernet success

- MAN Ethernet is the better quality/price Ethernet solution for High bandwidth
- i-SAN = additional service for MAN Ethernet, which provides Fiber Channel interfaces

To share access infrastructure and backbone for MAN and SAN interconnection  
Integration and flexibility

- i-SAN service is completely integrated into the network solution (after-sales services, operations, supervision, contract, billing)

SLAs

- i-SAN service has the SLA defined by the MAN Ethernet access subscribed
- coherent SLAs with the associated access (standard, secure, very secure)
- Isolation of SAN data (dedicated connection)
- commitments of performance (specific SLA)

**Nokia Siemens  
Networks**

**Thank You !!**

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