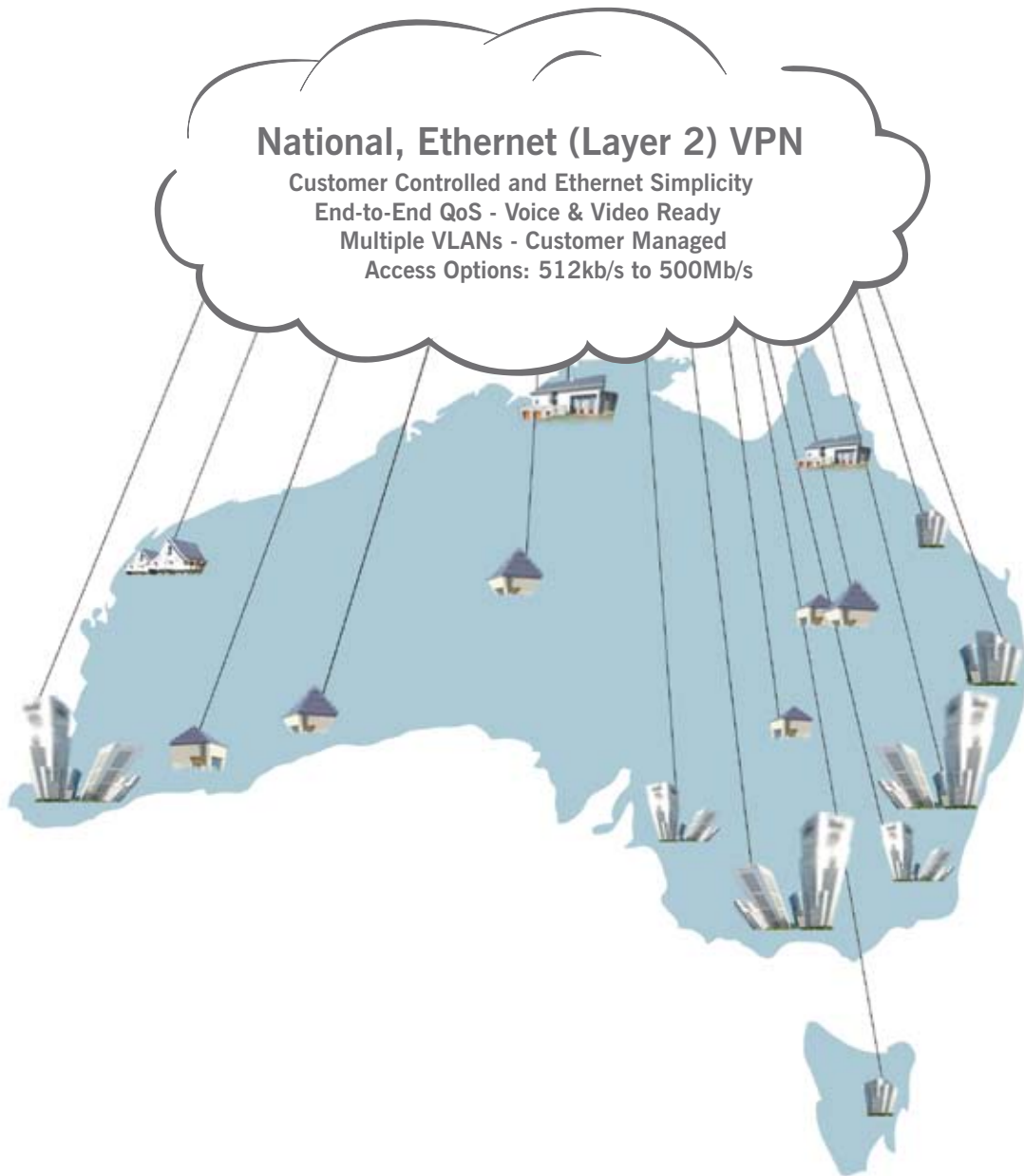


# National VPLS

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# NEXTGEN'S NATIONAL VPLS

Nextgen's **National VPLS** is a premium performance, Ethernet (Layer 2), customer controlled and flexible data service for connecting the multiple sites of Australian corporations.

VPLS (Virtual Private LAN Service) technology is internationally proven and defined by the IETF (the Internet standards body). Nextgen's implementation uses MPLS as the underlying technology to deliver carrier grade QoS (Quality of Service) and network availability.

Nextgen is the first Carrier to offer a **National VPLS** product in the Australian market.

Customer benefits of Nextgen's **National VPLS** service include:

- **The flexibility of a single service at any location** with any-to-any connectivity in a national, secure, VPN (Virtual Private Network) customer cloud
- **Support for the widest range of IT applications** because our Ethernet (Layer 2) VPN is Network Protocol Transparent <sup>(\*)5</sup>
- **Customer control** of the equipment that connects to the VPLS and how the access circuit is configured, compared to other VPNs where configuration changes typically require co-ordination with the Carrier
- **Support for real time and mission critical applications** with low latency and Quality of Service (QoS) included standard to all sites
- **Lowest total cost of ownership** with the simplicity of Ethernet (Layer 2) connectivity and our bundled pricing which is inclusive of most features

## VIRTUAL PRIVATE NETWORKS (VPNs)

A Multipoint VPN is a Carrier provided data networking service, where the Carrier's data infrastructure is used to provide secure, private connectivity between the customer sites.

The architecture is often described as point-to-cloud, which has clear benefits compared to the alternative of deploying multiple, individual point-to-point data services.

The key user advantages of Multipoint VPN solutions include:

- **Simplicity** of management with a single data service to each site
- **Fully meshed**, 'any-to-any' connectivity for user flexibility
- **Ease of change management** for adds, moves and deletes
- **Lower overall cost** compared to deploying individual point-to-point services



# VPN SOLUTION COMPARISONS

There are three main types of Multipoint VPN product offerings in the Australian market, with typical implementations described below:

## 1 National VPLS

A new generation, nationwide, Ethernet (Layer 2) VPN now available from Nextgen.

## 2 IP VPN

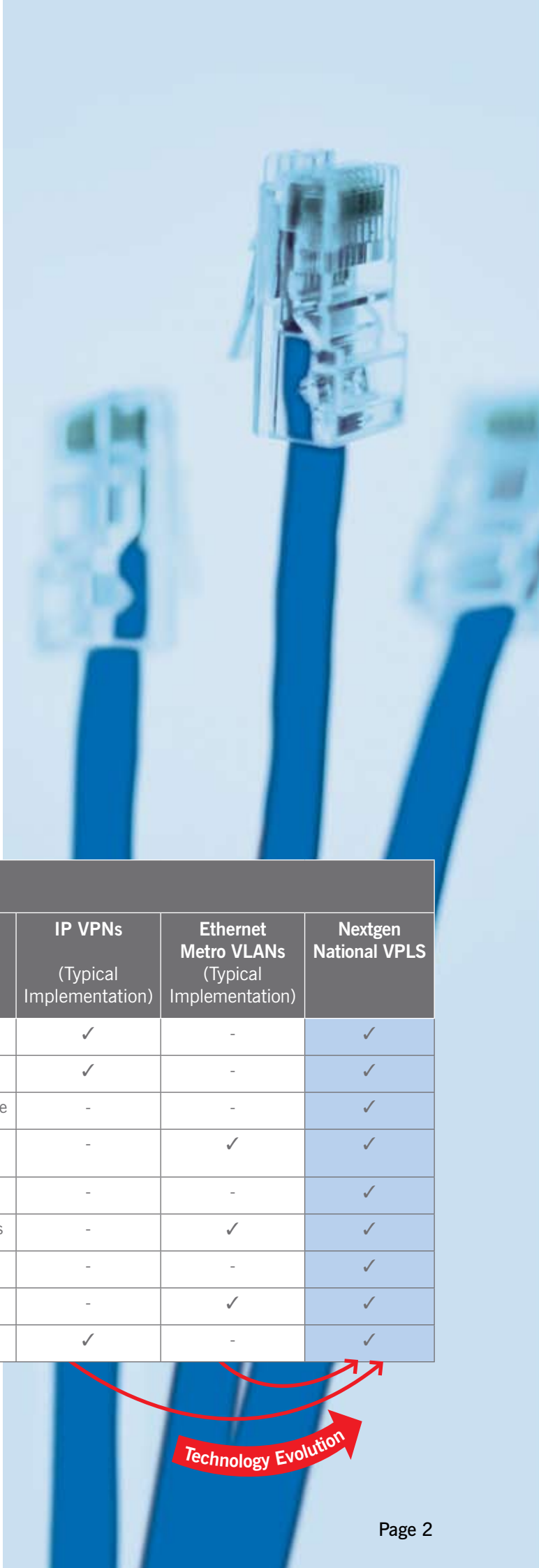
A Layer 3 (Internet Protocol) VPN. Available in Australia for about 5 years, IP VPNs were the forerunner in national VPN services, but now lack the flexibility and customer control that is available with VPLS technology.

Typically, changes must be managed by the Carrier in a co-ordinated outage window and carriers tend to charge extra according to the configuration and QoS options selected by the customer.

## 3 Ethernet Metro VLAN

Local City based Ethernet, Layer 2, VPNs that are typically not based on an MPLS platform and therefore limited in scale, capability and performance.

Multiple VLANs, if offered, are charged and controlled by the Carrier. A 'virtual national' service can be provided by packaging two or more Metro VLANs together and additionally charging for interstate transmission.



## VPN FEATURE COMPARISONS

Feature	IP VPNs (Typical Implementation)	Ethernet Metro VLANs (Typical Implementation)	Nextgen National VPLS
Single, Integrated, National Solution	✓	-	✓
Bundled Interstate Bandwidth	✓	-	✓
Specified as Uncongested Switching and Transmission Performance	-	-	✓
Customers Not Required to Co-ordinate Routing Information with the Carrier	-	✓	✓
Multiple VLANs with Customer Nominated VLAN IDs	-	-	✓
Customer Choice of Switch (Bridge) or Router Interconnect Options	-	✓	✓
QoS (Quality of Service) Included as Standard (*7)	-	-	✓
Network Protocol Transparent	-	✓	✓
MPLS Based Scalability and Resilience	✓	-	✓



# NATIONAL VPLS FEATURES

The features of Nextgen's National VPLS are summarised as follows:

## Connectivity

### Any-to-Any Connectivity

All customer sites are part of a fully meshed, secure customer network, with any site able to direct traffic to any other site, at any time, and under full customer control.

### Single National Network with Bundled, Unlimited Interstate Bandwidth

Customers connect to a single, fully integrated National VPLS network, which is engineered to provide uncongested and unlimited interstate transmission that is bundled into the price for each site.

### Range of Access Options

Customer access circuits are available with Fibre, SHDSL, ADSL and Wireless technologies to provide a range of customer price/performance trade off options.

As customer needs evolve, access circuit performance can be readily changed within the category of any circuit type.

## ACCESS CIRCUIT OPTIONS

Technology	Coverage			Speed (Subscriber Information Rate)	Support for Multiple VLANs (802.1Q Tagging) <sup>(*1), (*2), (*4)</sup>	Protocol Transparent <sup>(*5)</sup>
Fibre	CBD	Metro		4Mb/s to 500 Mb/s	Yes	Yes
SHDSL	CBD	Metro	Country	512kb/s to 4Mb/s	Yes	Yes
Wireless	CBD	Metro		512kb/s to 100Mb/s	Yes <sup>(*6)</sup>	Yes
ADSL	CBD	Metro	Country	512kb/s to 20Mb/s	No	Yes

## Customer Interconnect Options

Most of the VPLS Access Circuit options (see table above) support 802.1Q VLAN tagging which allows customers to transparently carry multiple, customer nominated VLANs over the VPLS.

Some of the Access Circuit options (for example low cost ADSL circuits) do not support 802.1Q VLAN tagging and thus do not support VLAN transparency.

A customer 'VPLS instance' can be formed using a mixture of Access Circuits that support VLAN tagging and those that do not support it. In all cases, an Ethernet service data unit of 1500 Bytes (IP-MTU = 1500B) is supported.

The customer equipment for an Access Circuit can be a Layer 2 switch, Layer 3 switch or Router.

# NATIONAL VPLS FEATURES CONT'D

## Performance

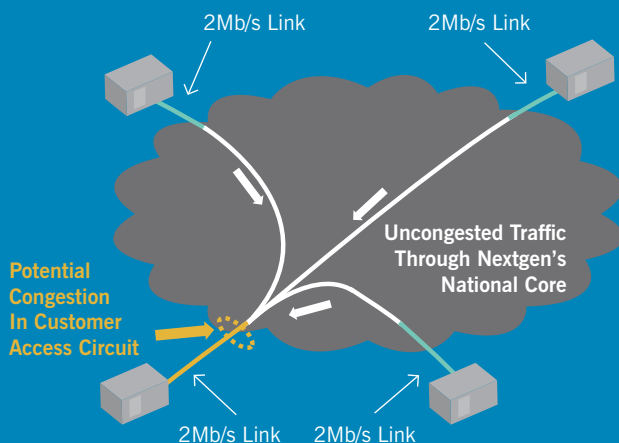
### Uncongested Performance

Nextgen's core National VPLS network is designed and dimensioned to provide uncongested switching and transmission performance such that customers can be assured of maximum throughput and minimum latency.

### QoS

While Nextgen's national VPLS network is engineered for uncongested performance, there is the potential for congestion in customer access circuits, depending on customer usage patterns.

#### CUSTOMER TRAFFIC SCENARIO



#### QOS PRIORITY LEVELS

Nextgen provides four traffic priority levels for customers to manage congestion, end-to-end through their network and across the Nextgen National VPLS cloud.

Class	Priority	Maximum Rate	Typical Use
Network Control	1	5% of SIR*	Routing protocols and signalling
Ultra Low Jitter	2	30% of SIR*	Leased line emulation, PABX trunking
Real Time	3	up to 100% of SIR	VoIP, video, critical transactions
Data	4	up to 100% of SIR	Citrix, email, web, data servers
Broadcast & Flooding	-	up to 256kb/s or 10% of SIR*	Network address discovery

\* These service categories are rate limited to protect customer network performance

Nextgen honours customer packet marking with options of:

IEEE	802-1P	Ethernet Priority
IETF	RFC 971	IP Precedences
IETF	RFC 2474	Diff Serve Code Point

## Customer Data Control and Management

### Multiple Customer VLANs

Customers may segregate their traffic with multiple VLANs through customer controlled 802.1Q tagging. Customers can nominate their own VLAN IDs and the number of VLANs per customer is not limited or charged in Nextgen's core network. <sup>(\*1) (\*2)</sup>

Nextgen will configure multiple virtual WAN instances for customers requiring greater network segmentation than is supported by VLANs.

### Protocol Transparent

Nextgen's National VPLS service is Network Protocol Transparent. <sup>(\*5)</sup>

### Customer Configuration Management

Nextgen's VPLS customers are empowered with configuration control of their VPLS services where the technology permits.

Customers can manage their own configuration for:

- Service configurations supporting Routers or Bridges as Customer Equipment
- Use of VLAN tagging to implement multiple VLANs <sup>(\*2)</sup>
- Adding, removing or moving access circuits
- Packet marking for four (4) service classes
- Scalable MAC address learning is implemented automatically in Nextgen's core network for traffic forwarding <sup>(\*3)</sup>

### Price Model

We offer a simple, bundled pricing model with most features included in a single access circuit price per site.

There are no separate charges for usage or additional features such as QoS VLANs, additional MAC address capacity or interstate capacity.

### On Line Portal and Billing Information

Nextgen's on-line secure customer portal provides information about customer services including the status of new orders in progress and billing information.

Customers can nominate a name for any service (eg 'Bridge St 10Mb/s link') so that each service can be readily identified with customer-friendly terminology. This can simplify customer analysis of the invoice, auditing or intra-company cross charging where required.

<sup>(\*1)</sup> Note that multiple VLAN access is not supported with some service options.

<sup>(\*2)</sup> In some circumstances, Nextgen needs to configure its termination CPE with the customer required VLAN IDs.

<sup>(\*3)</sup> We control, and release in blocks the total number of MAC addresses that each customer needs to have visible through Nextgen's core network.

<sup>(\*4)</sup> The list of access options is a summary table. Some variants of these services have 802.1Q limitations. Please contact Nextgen for more detailed information.

<sup>(\*5)</sup> Some Access Circuits may filter certain control protocols (i.e. CDP) unless tunnelled.

<sup>(\*6)</sup> Some types of wireless services do not support multiple VLANs.

<sup>(\*7)</sup> Nextgen applies QoS based upon the individual marking of each packet. Some providers call this "Dynamic QoS".

# THE USER EXPERIENCE – OUR CUSTOMER VALUE PROPOSITION

## The Ability To Be Flexible And Responsive

A key feature of Nextgen's National VPLS is its customer controlled flexibility, which translates into the ability for network managers to say 'easy' to any reasonable request from the business that they support.

Without additional charges or carrier imposed controls, customers can:

- Transmit data between any sites, fully meshed, without having to consider interstate traffic dimensioning or charges
- Implement virtually any application on our 'Protocol Transparent<sup>(\*)</sup>' network
- Centralise or distribute hosted applications as and when required for cost savings, disaster recovery and general risk management
- Design IP address architectures to meet functional business needs rather than networking constraints and change these as required
- Deploy real time applications such as voice and video which require end-to-end QoS
- Control security and access through the creation and use of multiple VLANs, with customer nominated VLAN IDs
- Connect with Routers or Bridges on a site-by-site basis to fit local needs
- Extend your LANs transparently over the WAN
- Deploy in a staged approach with customers having the option to commence a VPLS deployment by mirroring current architecture, and then later implementing more advanced capabilities, under their own control
- Manage change by performing adds, moves and changes without the need to reconfigure other sites or involve the Carrier



### Corporate Users Constrained

- Telco networking constraints
- Carrier controls
- Surcharges on data value and network performance

### Corporate Users Freed and Empowered

- Customer control, easy and flexible
- Pure data networks - use how you wish
- Quality of service is assumed and standard

# THE USER EXPERIENCE CONT'D

## Lowest Total Cost of Ownership

- Ethernet connectivity provides the foundation for the lowest cost of ownership in terms of both equipment and customer expertise:
  - Ethernet ports are the most common and lowest cost network interface option available for customer equipment
  - Expertise in Ethernet technology is the most pervasive and ubiquitously available skill with IT networking staff
- Our bundled pricing and extensive customer control capabilities means that through the life of the service, customers can expect consistency of monthly fees, regardless of traffic volume or how the performance capability of our network is used

## Leveraging the Maximum Value from IT Innovations – Future Proofing

The ideal IT planning environment is where corporations can develop their IT direction with independence from networking constraints.

While the term 'future proof' can be loosely used, we believe that Nextgen's National VPLS, with its premium performance, QoS and customer controlled flexibility is the Australian data networking solution that most complies with the label of 'future proof'.

## Customisation

At Nextgen we take pride in our ability to meet special customer requirements. Nextgen will work with you to meet the customised solution needs of your business.

Nextgen reserves the right to amend the service description at our sole discretion.

The product description contained in this brochure is a summary description. Contact us for a detailed technical data sheet.

Comments about other technologies that may form the basis of competitor products are opinions based on our interpretation of competitor product information available to Nextgen at the time of print.



## About Nextgen

### Our Services

Nextgen is a specialist provider of high performance data services.

### Network

Nextgen owns and operates Australia's third largest fibre network and Australia's first National VPLS network.

### Customers

Our customers are Carriers, Corporations and Government.

### Status

We are an Australian Telecommunications Carrier.

### Financial

We are profitable and debt free.

### Ownership

Nextgen is a wholly owned subsidiary of Leighton Holdings.

### Nextgen Networks Pty Limited

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