

## iACCESS

# iACCESS – AN INTELLIGENT PACKET-OPTICAL ACCESS SOLUTION FOR BUSINESS ETHERNET AND SMALL CELL DEPLOYMENTS

## Scalable Operations, Easy Commissioning

The Infinera Intelligent Access, or iAccess, solution is built to address the need for highly automated access networks. Combining optical and Ethernet solutions, the Infinera iAccess solution delivers a range of capabilities to meet the needs of service providers building access networks for business Ethernet and small cell networks. These service providers are looking for methods to rapidly scale their networks to meet increasing demands, while optimizing for cost-effective operation. Infinera offers unique capabilities in metro and metro access networks that can help these providers meet the higher performance and management requirements of business and mobile applications.

The bandwidth challenges faced by operators today are driven by trends that have been well-publicized for causing an explosion in data traffic. This growth has in turn driven the demand for higher-bandwidth carrier networks.

Two applications contributing to increased bandwidth demands and the need for effective access network management include business Ethernet services and small cell networks.

Business Ethernet access applications are business-critical and have unique needs. Service outages have immediate impact on businesses and cause a demand for high service availability, monitored service level agreements (SLAs), and visualization of service performance to customers. Customers have higher performance expectations, with typical speeds from 100 megabit per second (M) to gigabit Ethernet. Some business applications are also very latency-sensitive.

Small cell deployments have similar requirements and add additional requirements. High-quality synchronization performance is essential to perform well. Physical restrictions are also higher, with equipment deployed in a wide range of environmental conditions as well as in low power or limited spaces.



## Current Ethernet Access Alternatives Aren't Good Enough

The alternatives available to access network providers fit roughly into two categories. Neither category meets the critical needs for business Ethernet and small cell access networks.

Solutions designed for residential applications, such as gigabit passive optical network (GPON), Ethernet passive optical network (EPON) and very-high-bit-rate digital subscriber line (VDSL) typically support asymmetrical bandwidth usage, when higher download speeds and lower upload speeds are typical, as usage is heavily driven by downloaded video demands. Solutions based on these technologies typically do not deliver the management capabilities needed to support business-critical applications, because these solutions suffer from limited service operation, administration and management (OAM) capabilities, a lack of customer SLA visibility, limited bandwidth upgrade possibilities and security concerns. Some customers also require symmetrical bandwidth and higher bit rates than these solutions can provide.

To gain these essential management techniques and meet performance demands, some providers use solutions intended for carrier backhaul. These premium solutions come at a cost that is too high for most access networks. This higher cost is driven by requirements for a dedicated fiber with active Ethernet per customer, advanced demarcation equipment at the customer premises or complex commissioning processes.

## The Infinera iAccess Solution

The Infinera iAccess Solution is built on elements of the Infinera TM-Series optical product offering, including intelligent wavelength division multiplexing (iWDM®)-passive optical network (iWDM-PON), Transport Network Manager (TNM), Native Packet Optical 2.0, and Enlighten® Portal, along with additional features and products. This allows Infinera to deliver a robust solution supporting key features:

- Auto-configured Layer 0 WDM connectivity
- Point-and-click service provisioning with automated turn-up
- Carrier Ethernet (CE 2.0) services and WDM transport
- Service visualization
- End-to-end SLA monitoring and management
- Auto-configured service OAM and fault isolation

## Solution Components Include

- iWDM-PON, enabling automatic and cost-effective wavelength tuning
- Native Packet Optical 2.0, for WDM transport and CE2.0 support
- Packet optical transport switch (EMXP), supporting access, switching and aggregation
- Gigabit Ethernet network interface device (NID) for customer premises equipment (CPE), featuring touchless auto-configure and turn-up
- Infinera Transport Network Manager (TNM) for service provisioning
- Enlighten Portal for customer-visible SLA reports

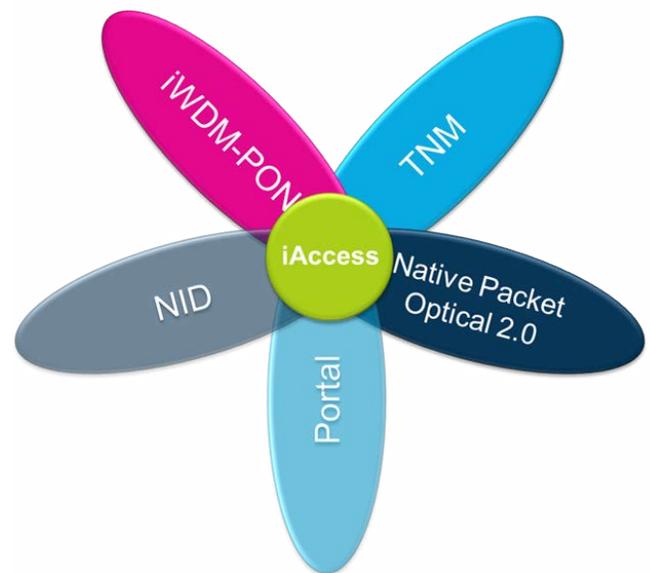


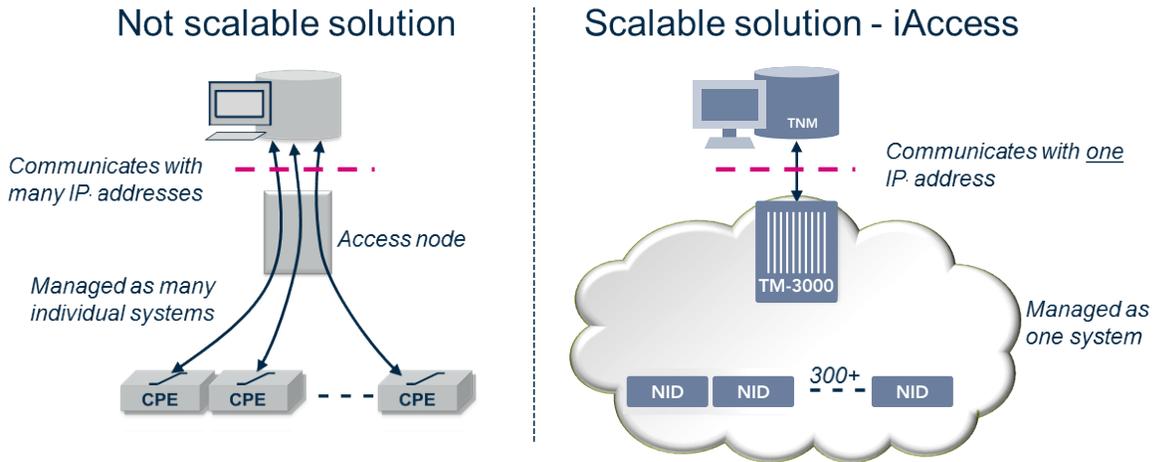
Fig 1. The iAccess Solution Is Built on the Infinera TM-Series Capabilities.

## Scalable Operation

iAccess combines the best of optical and Ethernet capabilities to deliver an access network supporting highly scalable operation. iAccess supports a one-system access solution for many CPEs and services, eliminating the need to manage many individual devices.

When using the Infinera NID, all provisioning and management is done centrally on the EMXP (used as an aggregation switch), providing a single IP address and simplified management through auto configuration of the NID. Using a single IP address for many CPE devices and services enables efficient management.

Infinera is committed to standardized services, being one of the first vendors to deliver a Carrier Ethernet 2.0 solution.



**Fig 2.** The iAccess Solution Is a One-system Access Solution Using a Single IP Address for Multiple CPEs and Services.

### Easy Installation and Commissioning

Automated CPE configuration for optical and Ethernet parameters combined with instant service turn-up and SLA monitoring brings easy installation and commissioning.

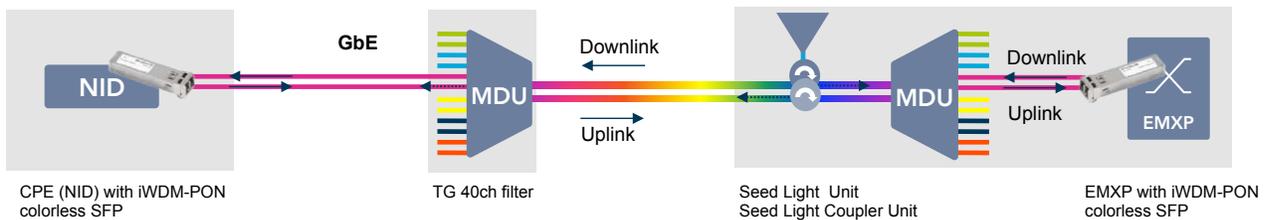
Infinera iWDM-PON uses auto-lambda technology to enable a fully automated optical layer using colorless, self-tuning optics. These optics tune to a specific wavelength, requiring no human interaction, as shown in Figure 3.

### iAccess Makes It Easy

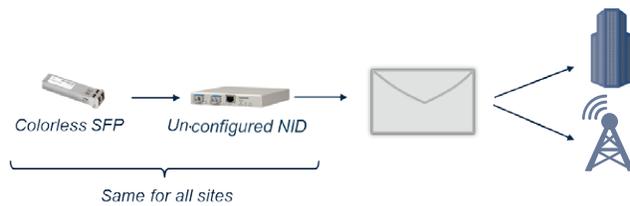
To install a NID (CPE) at customer premises, plug in the power and the rest happens automatically:

- Automatic optical connectivity from colorless SFP tunes to wavelength, giving a gigabit per Ethernet (GbE) link between NID and EMXP
- CPE discovery function in EMXP detects new NID and confirms type and version
- EMXP performs CE 2.0 configuration of accepted device
- Service is activated

If a NID needs replacement – just plug in a new NID.



**Fig 3.** Using the Infinera iWDM-PON Technology, Automatic Optical Connectivity from Colorless Small Form-factor Pluggable (SFP) Tunes to Wavelength, Giving a GbE Link Between the NID and TM-Series EMXP.



**Fig 4.** Unconfigured NIDs with Colorless SFPs Are Used at Customer Premises – Common Equipment Minimizes Cost of Spares.

### Instant Service Turn-up and SLA Monitoring with Enlighten

Pre-provision services using Infinera TNM before equipment is deployed:

- Create NIDs at endpoint
- Point-and-click provision E-Line (NID to NID or NID to EMXP)
- Apply service template to set all key parameters (bandwidth, quality of service [QoS], OAM)

Instant SLA monitoring:

- Instant SLA visibility through portal adds value to service
- Reporting on overall SLA compliance and network performance
- Visibility into and correlation between Layer 0, 1 and 2 in same portal

### Conclusion

Requirements for business Ethernet and small cell access networks are rapidly evolving, resulting in requirements for much greater bandwidth and more cost-effective solutions that can be deployed and maintained more easily. New solutions are needed to meet these demands.

Available alternatives are either too costly, with performance characteristics not needed in these access networks, or do not deliver the essential management features.

With extensive experience designing and building optical networks and a particular focus on edge, access and metro networks, the Infinera iAccess solution provides a complete portfolio of advanced access technologies, and a suite of management tools that deliver the capabilities required for demanding business and mobile applications that depend on the access network.

The Infinera iAccess solution gives operators an unprecedented combination of performance and cost-effectiveness by providing simplicity through automation, enabling them to deliver differentiating performance while minimizing total cost of ownership.

The iAccess solution is ideal for business Ethernet and small cell deployments.

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#### ABOUT INFINERA

Infinera (NASDAQ: INFN) provides Intelligent Transport Networks, enabling carriers, cloud operators, governments and enterprises to scale network bandwidth, accelerate service innovation and simplify optical network operations. Infinera's end-to-end packet-optical portfolio is designed for long-haul, subsea, data center interconnect and metro applications. Infinera's unique large-scale photonic integrated circuits enable innovative optical networking solutions for the most demanding networks. To learn more about Infinera visit [www.infinera.com](http://www.infinera.com), follow us on Twitter @Infinera and read our latest blog posts at [blog.infinera.com](http://blog.infinera.com).

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