



Powering the Internet of Things:

# SDN/NFV Architectures

**“Explosive growth in cloud services** and the number of Internet-connected devices is expected to propel the Internet of Things (IoT) market globally to \$3.0 trillion by 2020, says research firm IDC. The market, estimated to be \$1.3 trillion in 2014, is expected to grow at a compound annual growth rate (CAGR) of 13 percent through 2020, based on the installed and connected base of IoT devices. (Nov 10, 2014)

**From meat thermometers to smartwatches, businesses operate,**

**“Future belongs to the machines.”**

More than one billion smartphones will be shipped this year, and several million smartwatches and fitness monitors of various sorts will be worn. But if predictions about the so-called Internet of Things are right, the number of unmanned computing devices that populate the world, connected over wired and wireless networks, eventually will dwarf the number of devices that people carry around with them. Market research from Gartner predicts that the tally of network-connected devices, most of them not manipulated by a person, will soar from three billion to 25 billion in just seven years.”

- Barron's (Oct 11, 2014)



# Implications for Service Providers



Can Help

Scaling the Networks...End to End Security...Profitable New Services

Connected Cars



Connected Homes



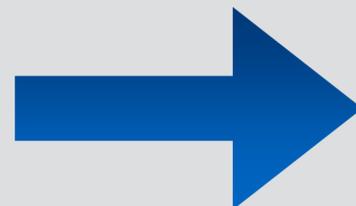
Connected Cities



Wearables/Connected Devices/Utilities



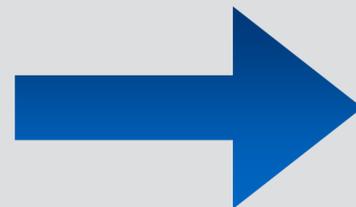
50B Connected Devices  
Worldwide by 2020



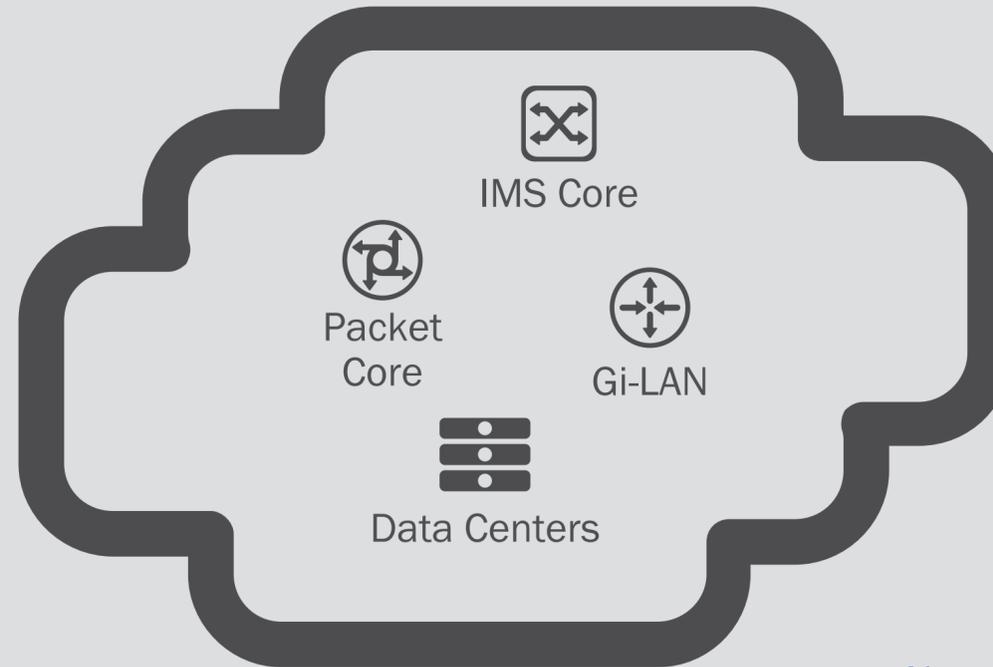
Surge in Connected Devices  
Accessing SP Networks



Spikes in Application  
Usage



Increasing Connection  
Rates (Connections per Sec.)



Service Provider Challenges

Network Signaling Spikes

Diameter Signaling Storms

Surge in DNS Queries

IPv6 Addressing  
Requirements

New DDoS Attack Vectors

DNS Security Vulnerabilities

New Advanced Persistent Threat Vectors

Lower ARPU per Device

# Solutions for Service Providers

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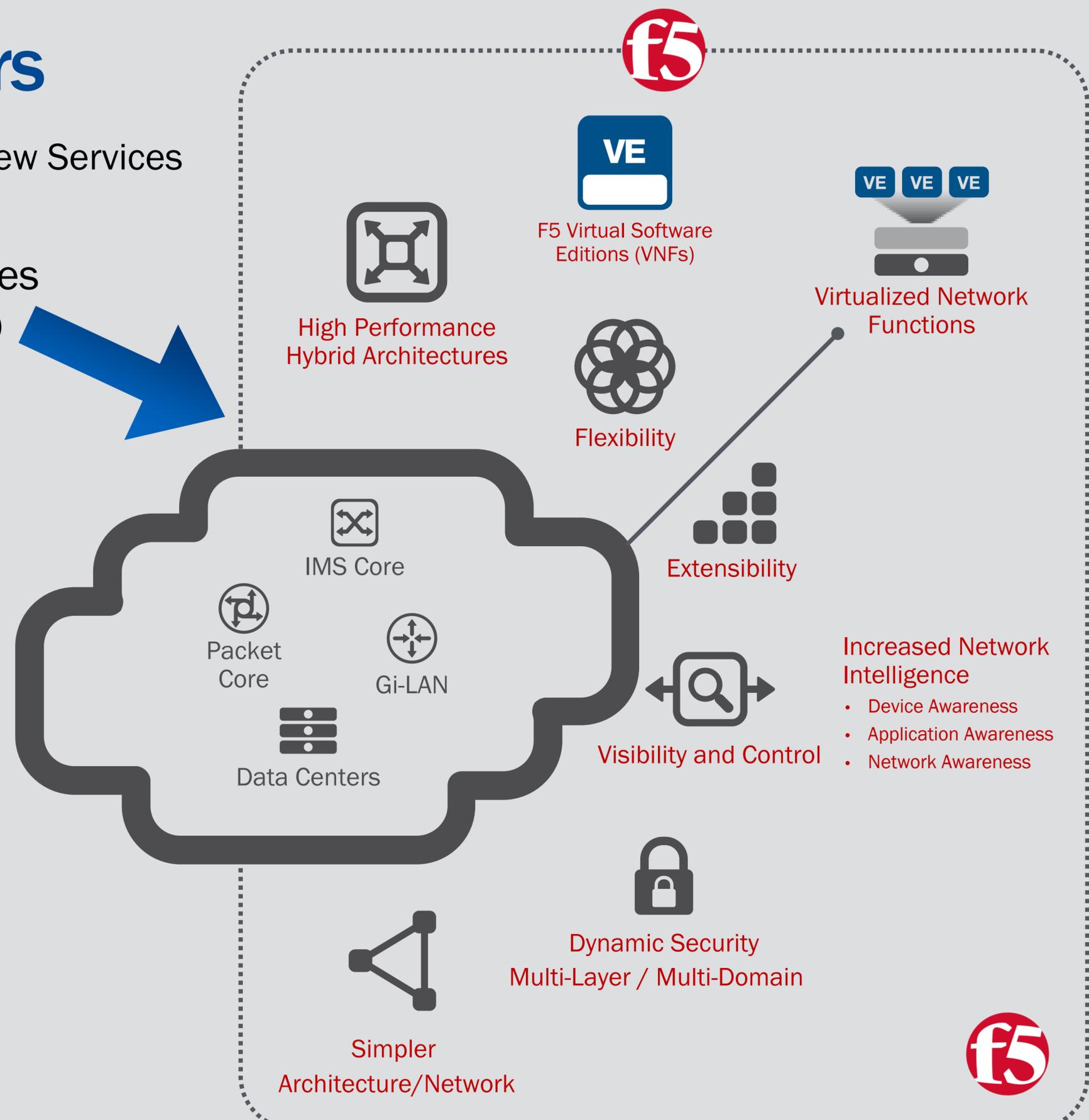


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# Hybrid Architectures / Breadth of VNFs

Scaling the Networks...End to End Security...Profitable New Services

Connected Cars



Connected Homes



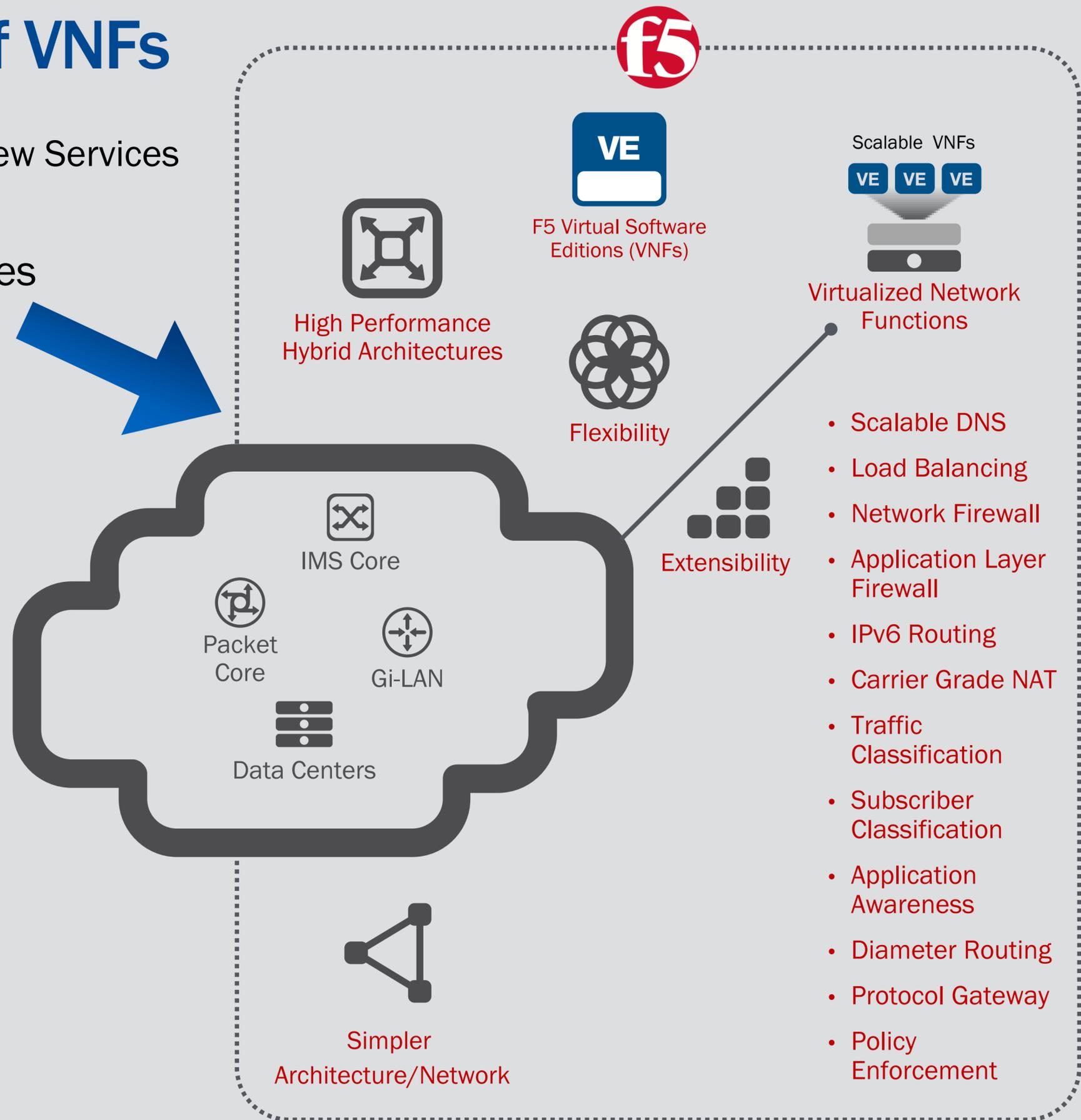
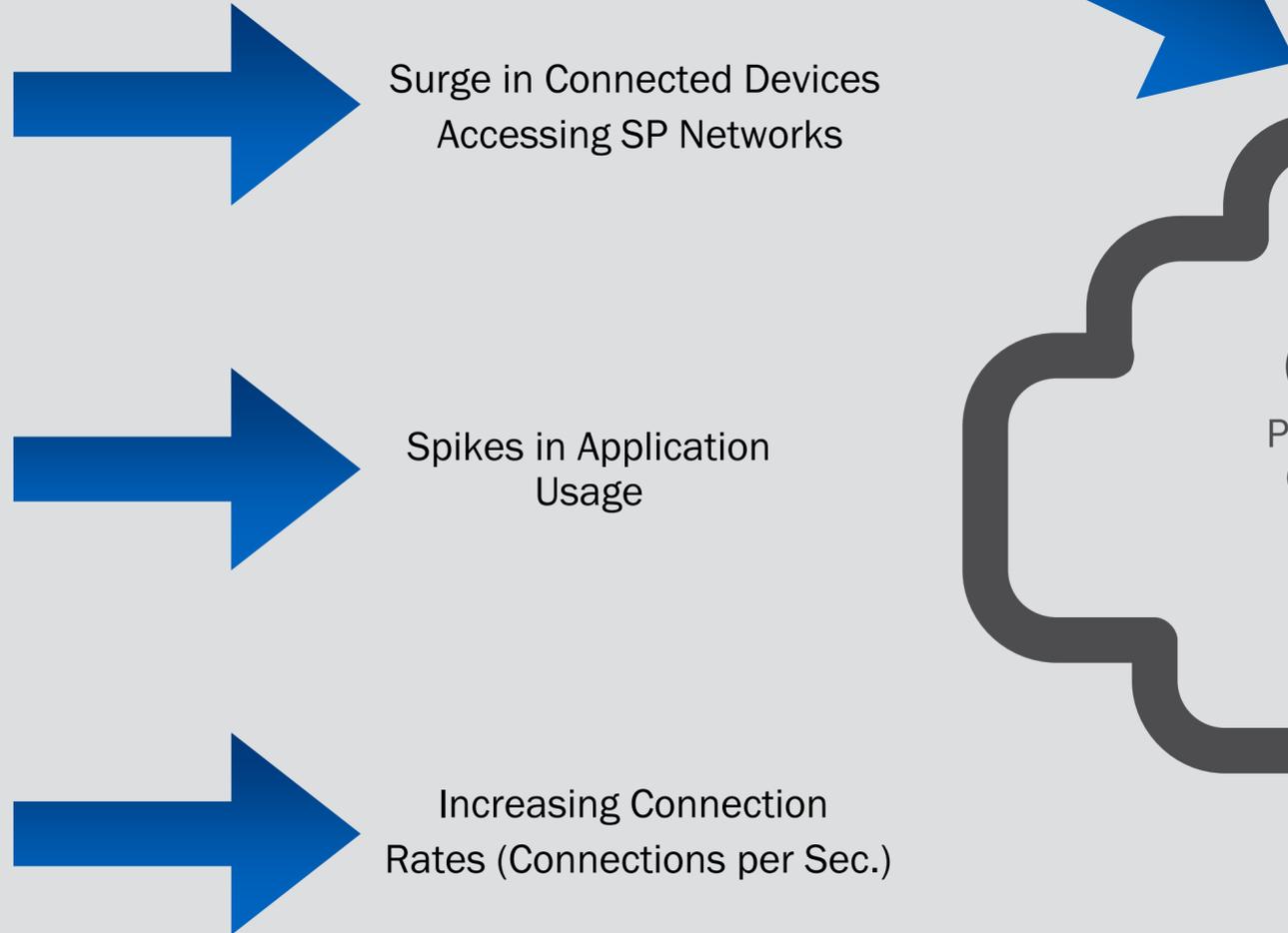
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# VNF Integration with Ecosystem Partners

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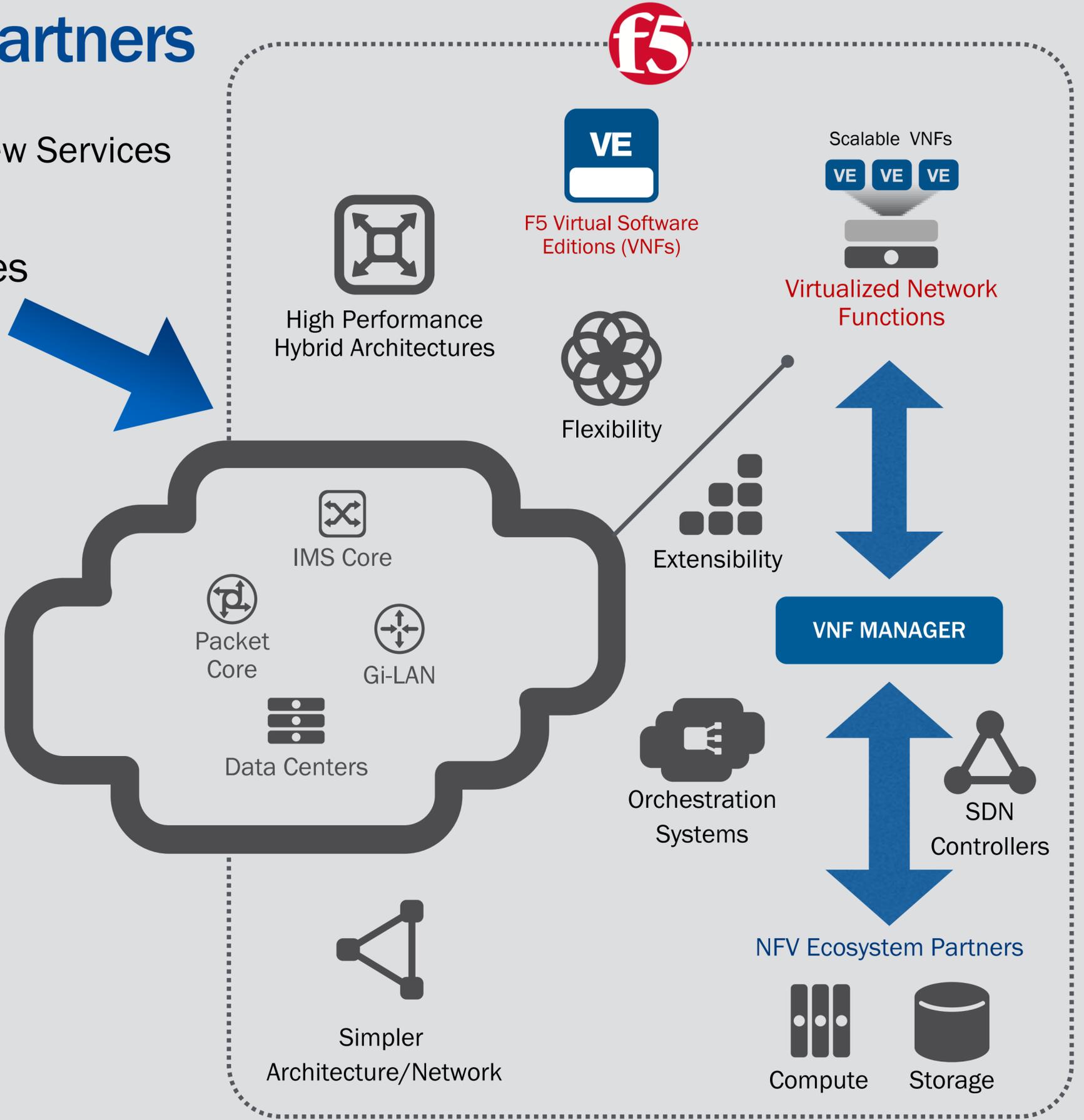
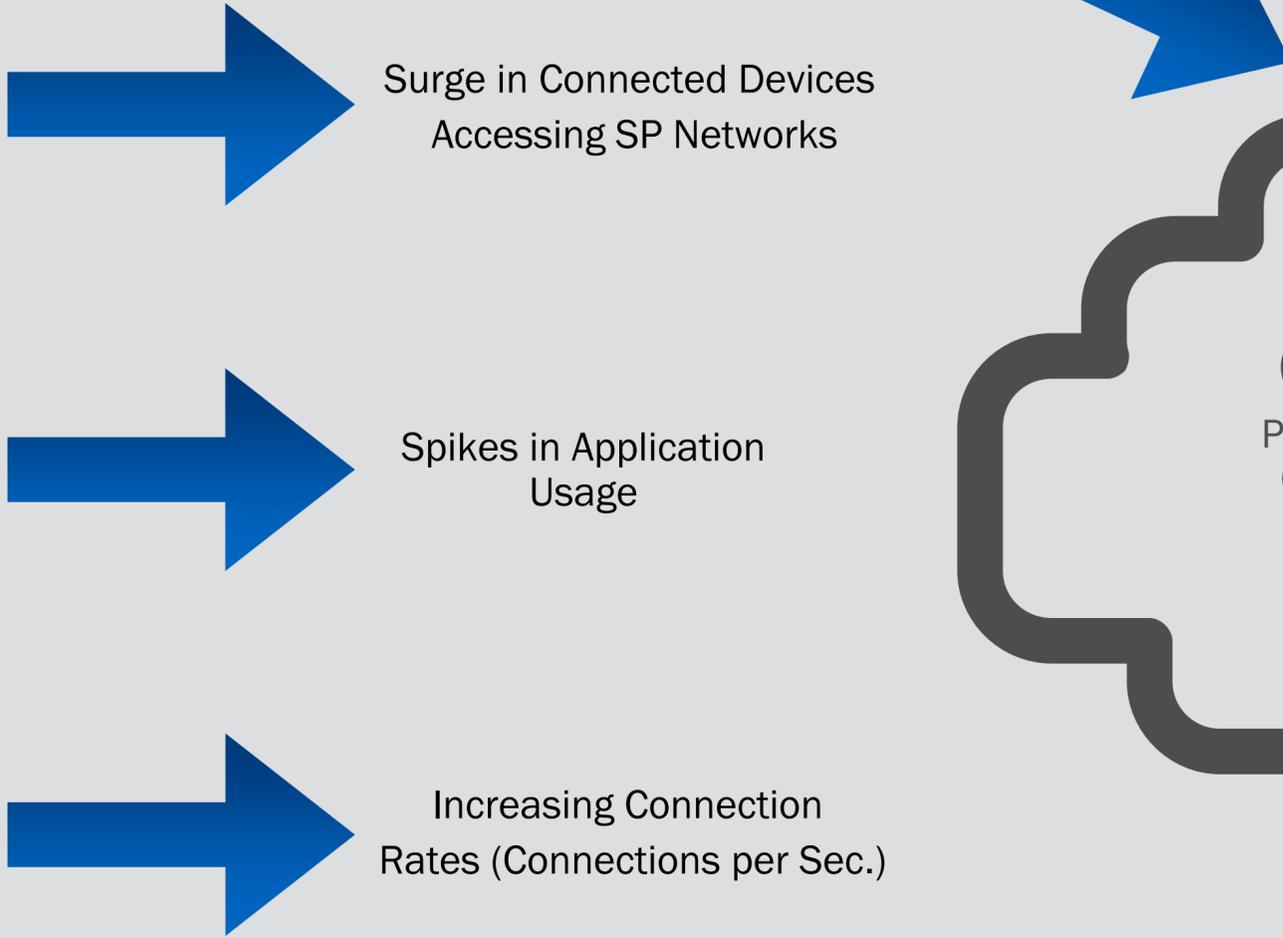
Connected Cities



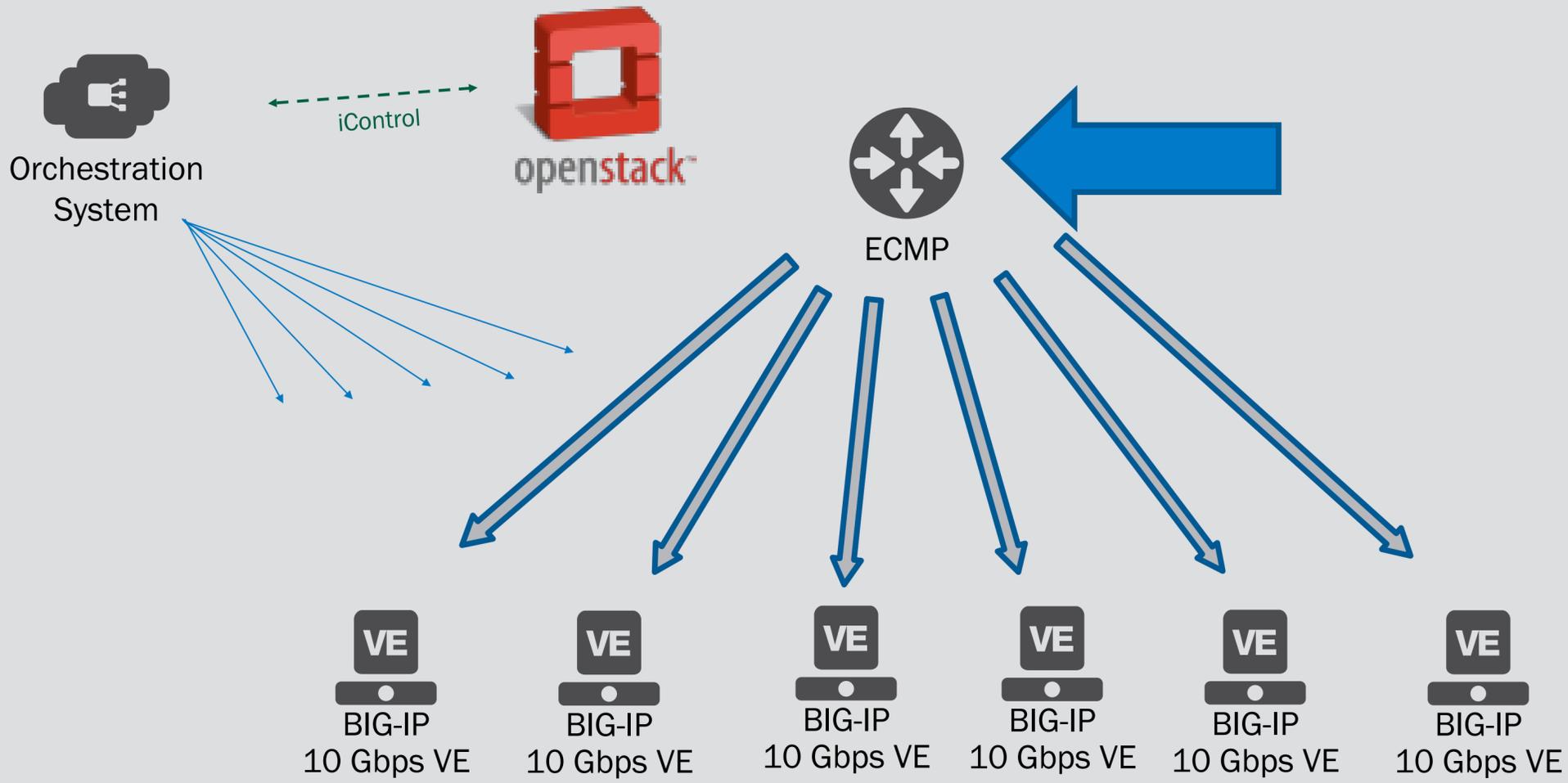
Wearables/Connected Devices/Utilities



50B Connected Devices Worldwide by 2020



# Scaling F5 BIG-IP VNFs



# Leveraging Scalable DNS from F5

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Connected Cities



Connected Homes



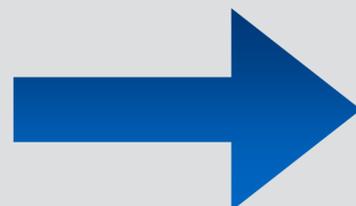
Wearables/Connected Devices/Utilities



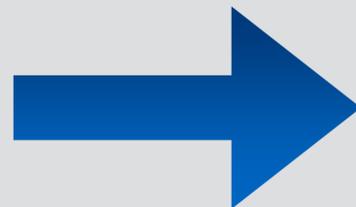
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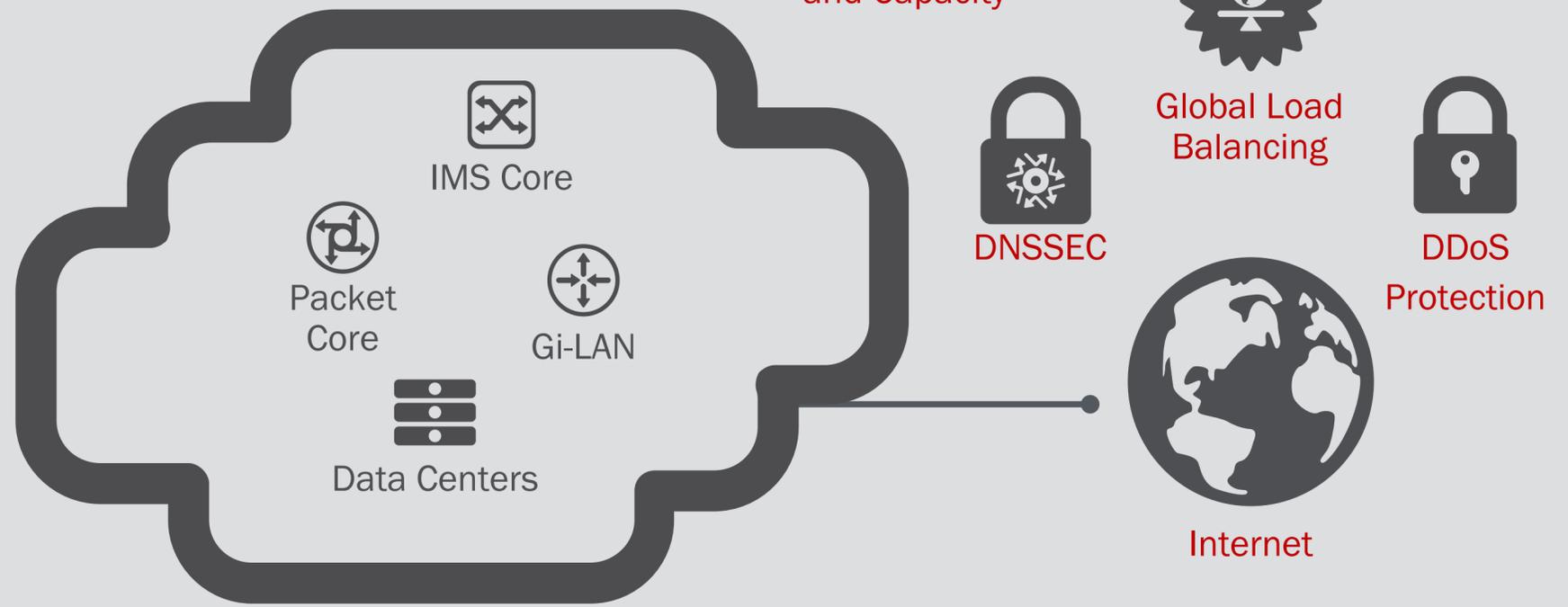
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# Leveraging Network Intelligence

Connected Cars



Connected Cities



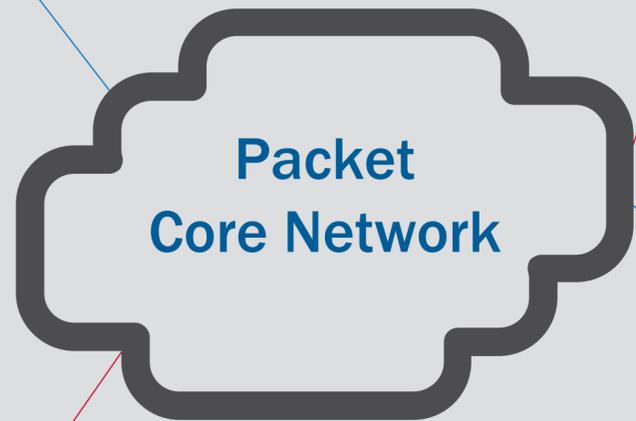
Connected Homes



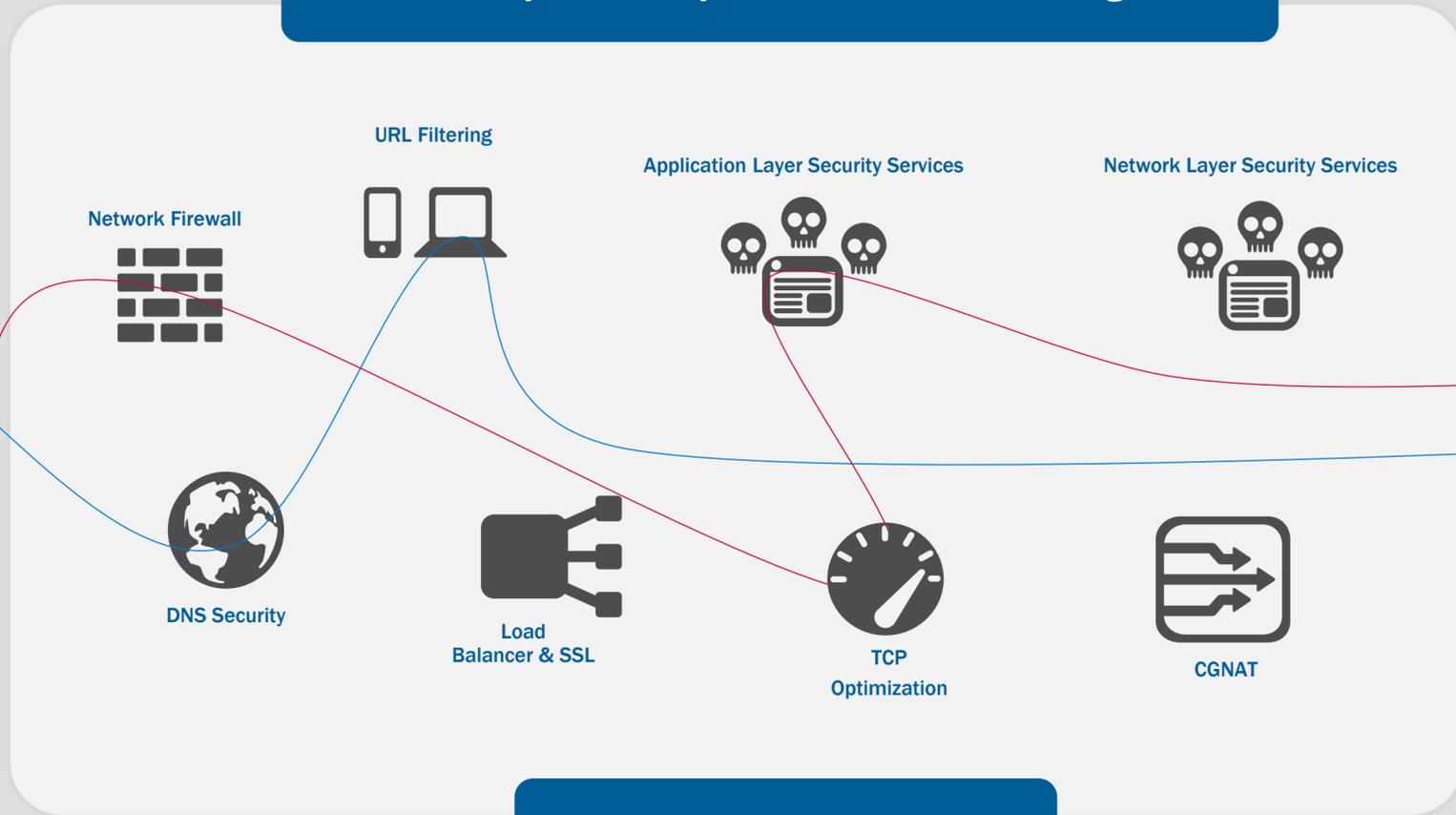
Wearables/Connected Devices/Utilities



Device Awareness  
Application Awareness  
Network Awareness



## Policy Based Dynamic Service Chaining



## Network Services

Enterprise Applications



Internet



Web / Cloud / OTT Services

- Create customized IoT service offerings
- Improve Network Performance
- Help Address Security vulnerabilities

# Leveraging Multi-Layer, Multi-Domain Security Solutions

Connected Cars



Access Management /  
Remote Access Security



High Performance  
Hybrid Architectures

Enterprise Applications



Connected Cities



Signaling Storm  
Mitigation

Diameter Security



IMS Core

CGNAT



Packet  
Core



Gi-LAN

Data Centers

DC Firewall

Connected Homes



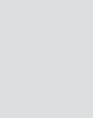
Protection from  
DDoS Attacks



Gi Firewall



Application Layer  
Firewall



Internet

Protection from  
DDoS Attacks



Web / Cloud / OTT  
Services



SSL Inspection

Wearables/Connected  
Devices/Utilities



Simpler  
Architecture/Network

