The Chinese Internet –
A view from the inside

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Telstra

What can an International Telco teach me about China?

Building network in China

Sai Ping SUNG
Chief Technology Officer
Telstra PBS
- A Telstra Joint Venture Company in mainland China since 2008

Experience
- Over 16 years in building and managing global IP network (AS4637)
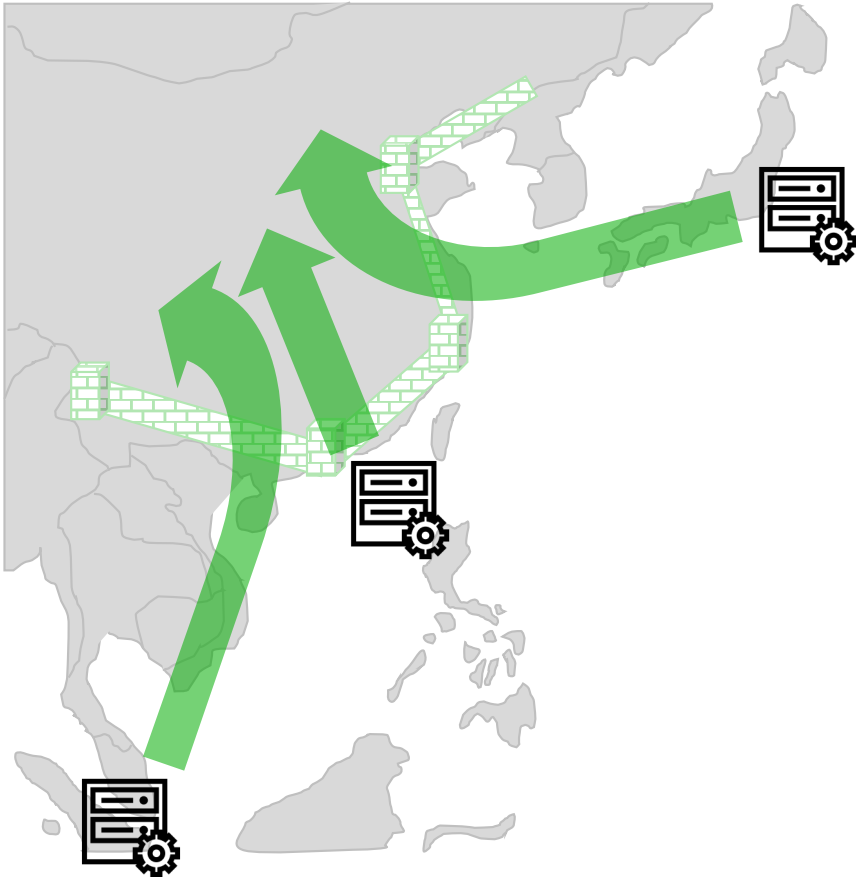- Over 4 years in building and managing domestic IP networks in mainland China (AS37965 & AS55988)

Personal Background
- Graduate of University of Wisconsin-Madison in the US
- Based in Hong Kong

Default China routing in Asia

Latency = 180ms+
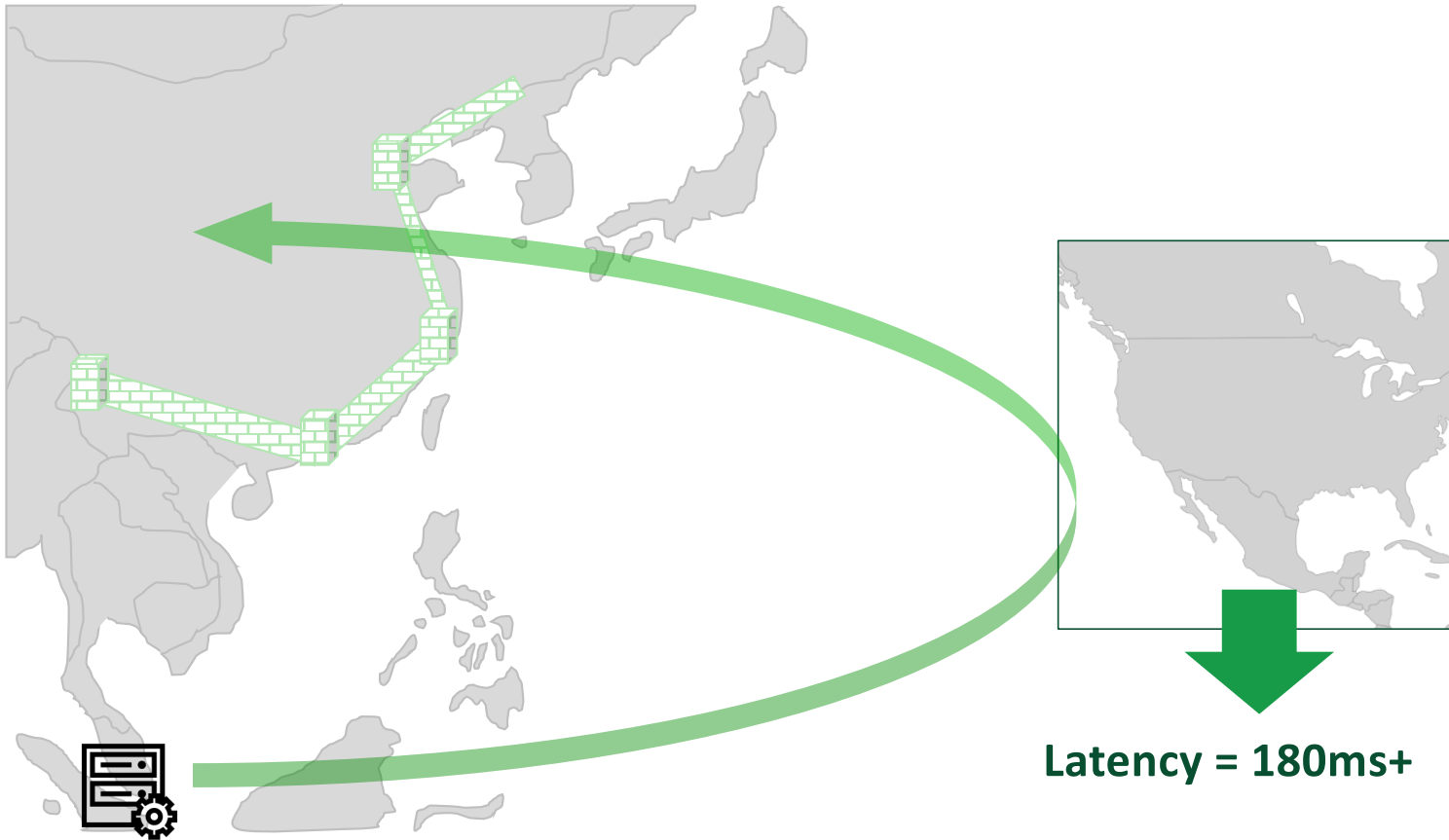
Shorter latency solutions for connecting to China

- Host servers typically in "open" DCs in Tokyo, Hong Kong, or Singapore
- Subscribe to ISP service including "direct China" option

- Cost to deliver relatively high
- Potential congestion issues at the firewall
- Quality is variable

Major Considerations in building network inside China

Frequent Change in government policy

Business Operation Compliances

Connectivity (Domestic & International)

Infrastructure Build

Licenses and Regulation Compliances

Regular Compliance Check
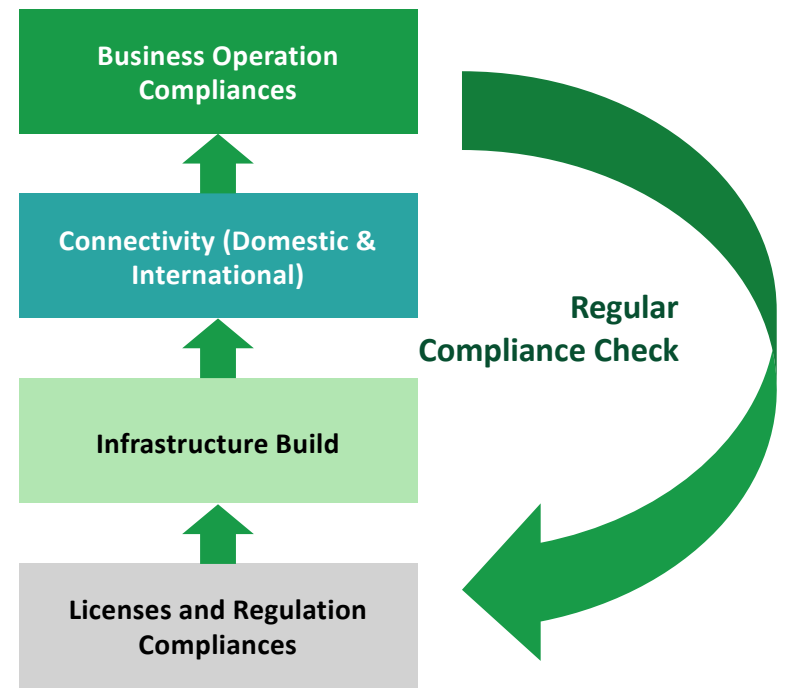
Key cloud and internet challenges inside China

#	Challenges	Key Items to Note
1	Internet Bandwidth	• Complicated Internet bandwidth in China with incumbent carriers • With IP addresses in China NIC (CNNIC)
2	Data Center Infrastructure	• Source of Data Center • Should build a strategic long-term partnership
3	Licenses	• Need a cloud/internet access license to operate and provide cloud service in China • Need a license to bill end-users in China • Complicated regulatory environment with frequent requirement/procedure changes
4	ICP Registration	• Required by end customers to open port 80 (for public websites) • A procedure that needs a licensed operator who owns the IPs to proceed
5	Local Relationships & Experience	• Local relationships necessary to drive successful implementation of services in China

Chinese Internet Regulation

Service Providers

- Telecommunications Law of the People's Republic of China
- Regulation on Telecommunication Business License
- Regulation on Internet Information Service
- Regulation on Internet Domain Names of China
- Rules for Internet Management

General Business Operation Compliance

- Cybersecurity Law of the People's Republic of China
- Guarding State Secrets Law of the People's Republic of China
- Regulation on Computer Information Network and Internet Security, Protection and Management
- Regulation on the Safety Protection of Computer Information Systems of the People's Republic of China

Internet and Information Security inside China

Internet traffic in China is subject to many rules and regulations to ensure Information Security. Content that is deemed undesirable or illegal will be removed.

- Great Firewall (GFW) at international gateways
- Port 80 is closed by default
    - Businesses who have a web server will need to apply for the opening of port 80
    - Must submit an Internet Content Provider (ICP) Registration (not ICP License) to the authorities, stating the services for which port 80 will be used (for mail servers, the email domain name must be registered in China)
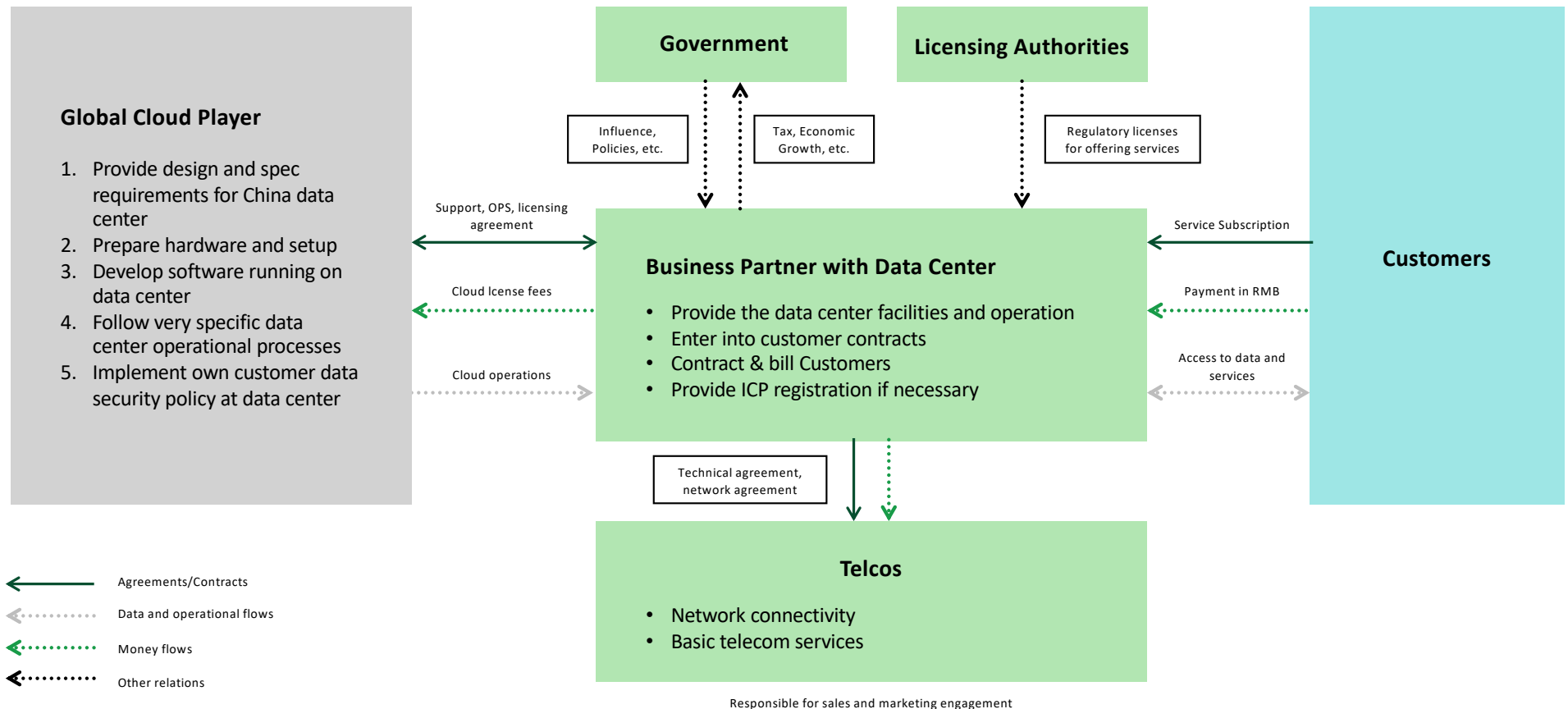

ICP Filing	• For end users who host web services in China, ICP Filing is needed for full IP accessibility (i.e. access to port 80, 443 etc.).
	
	• If end users website consists of following contents, formal approval is needed.
	  a. News, Education, Pharmaceuticals, and Medical Devices.
	  b. Publishing, Medical Care, Radio, Movie, and Television
	  c. Culture, Blog, WAP.

ICP License	• For operational websites containing commercial and business contents, such as on-line shopping, trading, gaming, etc., ICP license is required. • Foreign companies will be unable to acquire ICP license at this point. Foreign JV can apply in theory but is difficult to get approval in practice.

Setup a cloud platform inside China

Government

Licensing Authorities

Global Cloud Player

1. Provide design and spec requirements for China data center
2. Prepare hardware and setup
3. Develop software running on data center
4. Follow very specific data center operational processes
5. Implement own customer data security policy at data center

Influence, Policies, etc.

Tax, Economic Growth, etc.

Regulatory licenses for offering services

Support, OPS, licensing agreement

Cloud lcense fees

Cloud operations

Service Subscription

Payment in RMB

Access to data and services

Customers

Business Partner with Data Center

- Provide the data center facilities and operation
- Enter into customer contracts
- Contract & bill Customers
- Provide ICP registration if necessary

Technical agreement, network agreement

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- Network connectivity
- Basic telecom services

Responsible for sales and marketing engagement

Agreements/Contracts

Data and operational flows

Money flows

Other relations

China Network 101

Split into 3 Chinese networks in early 2000s:

- China Unicom (covers North China i.e. North of Shanghai)
- China Telecom (covers South China)
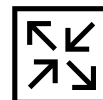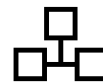- China Mobile (manages mobile)

GFW Typical Capabilities (when necessary):

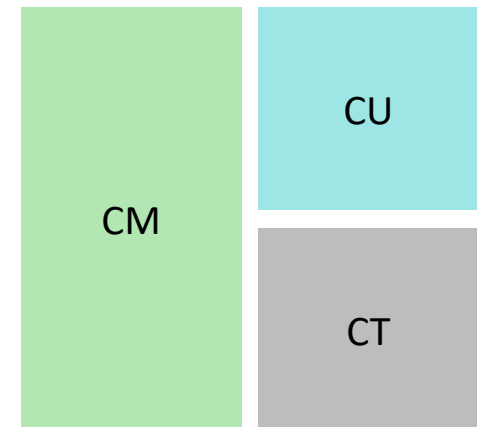- Black-hole on IP or range
- URL Filtering
- DPI

GFW Exchange Points (before connecting to cable landing station):
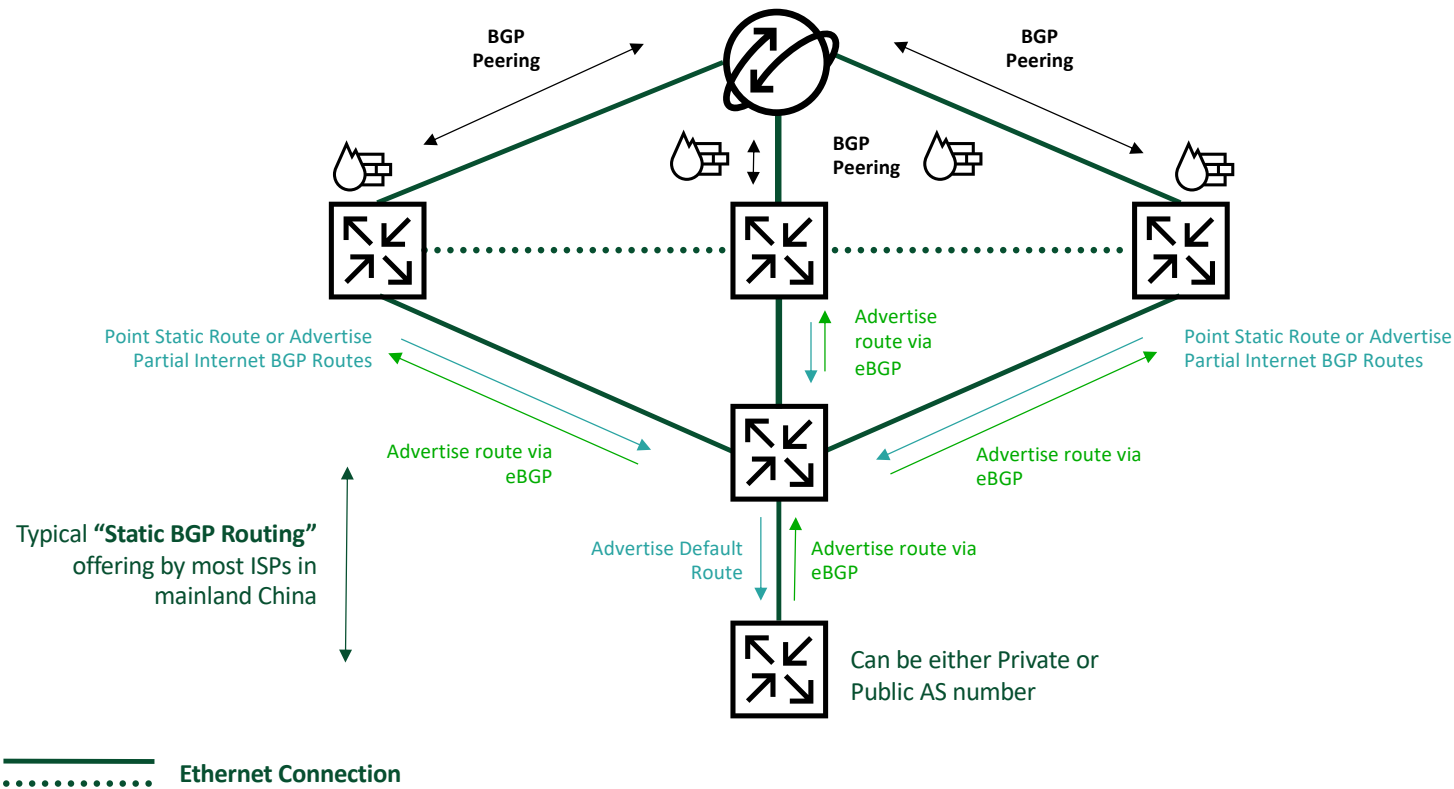
- Beijing
- Shanghai
- Guangzhou

Cable Landing Station

GFW (regional)

Routers at Internet Exchange Points

CU

CM

CT

Setup an internet platform inside China

BGP Peering

BGP Peering

BGP Peering

Point Static Route or Advertise Partial Internet BGP Routes

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Advertise route via eBGP

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Advertise route via eBGP

Typical **"Static BGP Routing"** offering by most ISPs in mainland China

Advertise Default Route

Advertise route via eBGP

Can be either Private or Public AS number

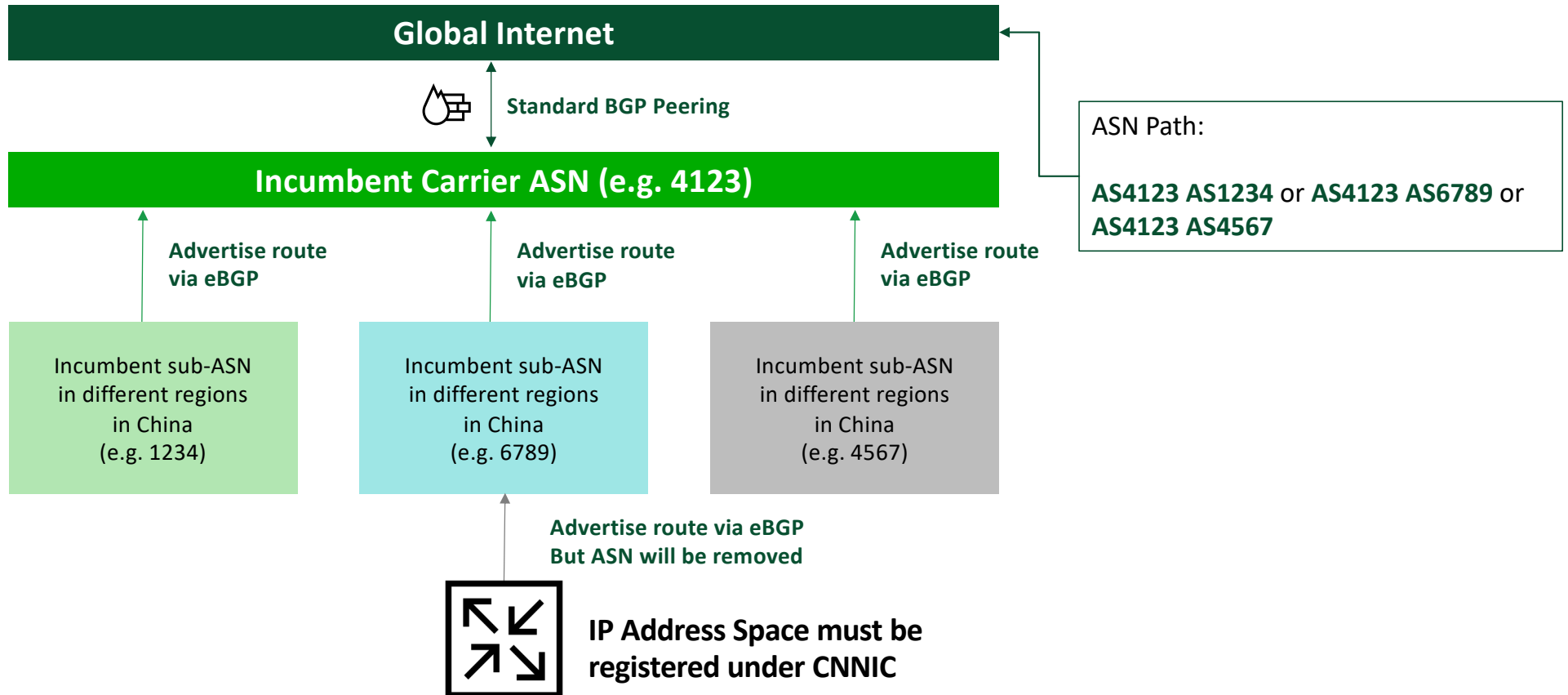———— **Ethernet Connection**
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Global Internet

Great Firewall (GFW) at 3 international gateways

3 x Incumbent Carriers

"Licensed" Domestic Internet Service Providers

Domestic Internet Platform

Network view from global routing space

Global Internet

Standard BGP Peering

Incumbent Carrier ASN (e.g. 4123)

ASN Path:

AS4123 AS1234 or **AS4123 AS6789** or **AS4123 AS4567**

Advertise route
via eBGP

Advertise route
via eBGP

Advertise route
via eBGP

Incumbent sub-ASN
in different regions
in China
(e.g. 1234)

Incumbent sub-ASN
in different regions
in China
(e.g. 6789)

Incumbent sub-ASN
in different regions
in China
(e.g. 4567)

Advertise route via eBGP
But ASN will be removed

**IP Address Space must be
registered under CNNIC**

Comparison of Technical Setup

Inside China

- Predominantly static route exchange
- Network routes are advertised to global internet by incumbents ASN
- All network routes must be registered under China NIC (CNNIC)
- No settlement free peering
- BGP peering is highly restricted

Outside China

- Dynamic BGP route exchange
- Network routes are advertised by individual BGP speaker under individual ASN
- Network routes can be registered under different NICs across the world
- Settlement free peering is available
- BGP peering is highly market-driven

Conclusions

- Running internet business in China feasible despite the highly regulated environment.
- Stay alert to frequent changes in regulatory requirement.
- "Static BGP" the default route exchange option inside China.
- Improved connectivity from connecting to multiple carriers in different locations (even without dynamic BGP route exchange)
- Importance of building redundancy in design

Q&A