High-performance WAN

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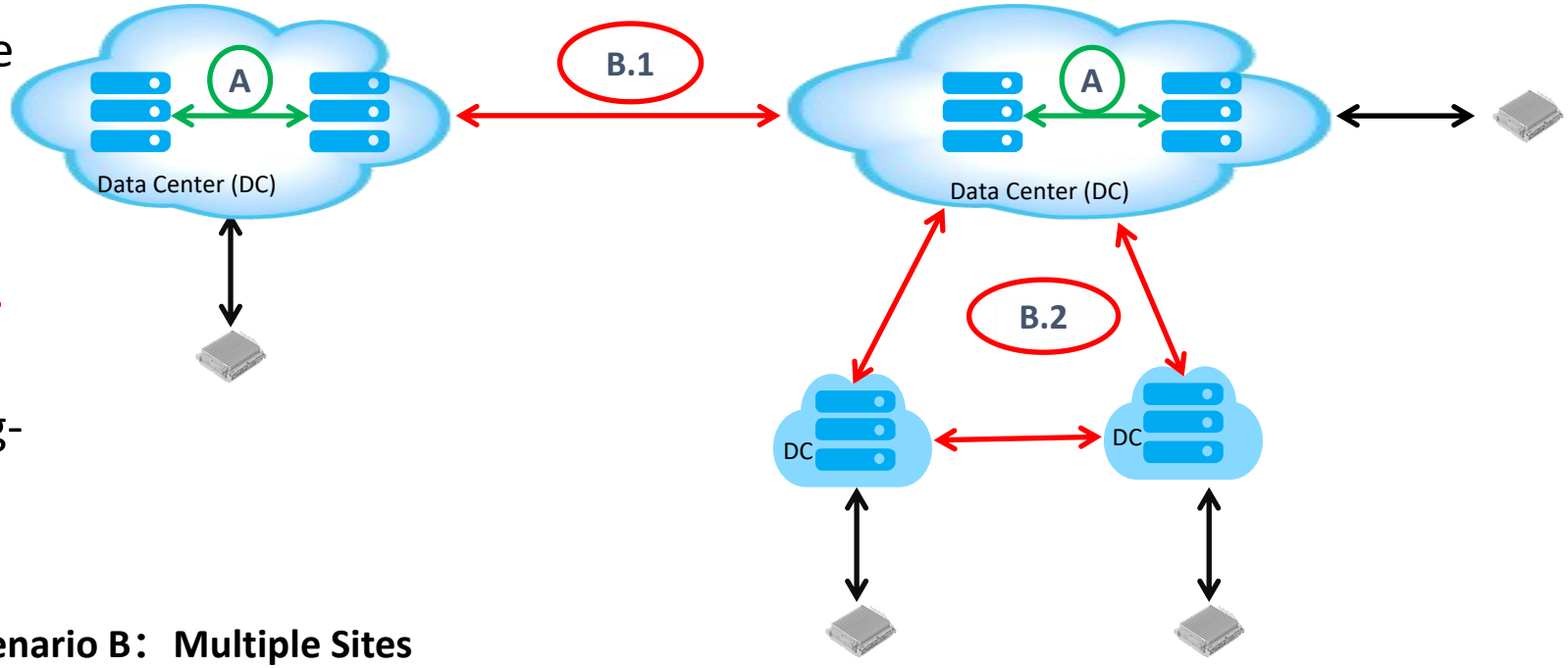
Use Cases and Motivation

- Aims to discuss the scenarios and use cases that certain services require effective high-throughput massive data transmission in WANs which called **High-performance WANs (HP-WAN).**
- Problems may be considered for long-distance connection and massive elephant flows data transmission.



Scenario A： Single Site(e.g. <10km)

- *HPC*
- *AI Traning*

High-performance DC Networks e.g.AIDC/CCO

Scenario B： Multiple Sites

- B.1 Long-distance Transmission between two Sites (e.g. >1000km)：
  - *HPC for Scientific Research*
  - *Distributed Storage*
  - *Data Express Service*
  - *Multimedia Content Production*
  - *Data backup and Disaster Recovery*
- B.2 Multiple DCs Interconnection (e.g. >100km):
  - *Collaborative Training across Multiple DCs*

High-performance WANs (HP-WAN)

Objectives and Requirements

- What are the characteristics for HP-WAN?
  - Massive elephant flows data with large burst, concurrent services co-existed with dynamic flows *(e.g. 10G~400Gbit/s)*
  - Long distances, multiple hops, paths and domains between DCs or from a site to DC *(e.g. >100km, >1000km)*
- What are the objectives and goals for HP-WAN?
  - The primary goal is to achieve effective high-throughput transmission which demands higher network performance
    - *ultra-high bandwidth utilization*
    - *ultra-low packet loss ratio*
    - *low latency and jitter*
- What are the gaps for existing technologies?
  - Optic Fiber direct connection *(e.g. OTN)*
    - *limited scale and deployment and high cost, requires using IP network resources*
  - DC Technologies *(e.g. PFC)*
    - *slow feedback and high Round-Trip Time (RTT) latency and jitter, requires improving flow control precision*
  - L3 Routing Technologies *(e.g. ECN/ECMP)*
    - *network is passive and unware of the status, requires coordination with the end systems*
    - *network resources is insufficient with low utilization rate, requires improving bandwidth utilization*
    - *long-distance transimission requires ultra-low packet loss, latency and jitter guarantees*

IETF120 Side meeting for High-performance WAN

- HP-WAN Side Meeting Planning
  - Start a discussion about use cases, problems, motivations and requirements of High-Performance Wide Area Networks to achieve high-thoughput transmission.
  - **Time: Tuesday 23 July-15：30~17:30 (Vancouver)**
  - **Location: Prince of Wales/Oxford**

- Open Issues
  - *Is the HP-WAN topic and problem space people want to work on?*
  - *What could the IETF do to help with these problems?*
  - *Which IETF technology is most impacted?*
  - *What are the next steps for HP-WAN discussions?*

Thank you!