
THOUGHTS ON CDN

CDN若干问题的思考

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OVERVIEW(概述)

- ✘ 1) CDN已经定义为通信基础设施
 - + 国内CDN牌照的发放，批准数十家CDN运营商
 - + 视频通信流量的占比大，信息模型中头部占比大
 - + 业务形态的改变（连接：点对点为主；业务流量：点到多点，特别是视频），降低传输冗余
- ✘ 2) 业务模型
 - + 点对点通信（连接数）
 - + 视频网站（AR、VR、4K、8K等）业务流量的占比快速增长
 - + 网站数量和连接数的比例，决定了CDN的使用范围

- ✘ 1) CDN become infrastructure
 - + The domestic CDN licenses issued, Dozens of CDN carriers are approved
 - + The proportion of video traffic is large, and the proportion of head in the information model is large
 - + Business form change (connection: point to point based; business flow: point to multipoint), reduce transmission redundancy
- ✘ 2) Service mode
 - + Point-to-point communication (connections)
 - + Video website (AR, VR, 4K, 8K etc.) traffic rapid growth
 - + The number of sites and the number of connections ratio determines the range of CDN

OVERVIEW(概述)

- × 3) ICN、NDN、SCN等的关系
 - + 未来网络的多种形态与CDN有关
 - + 未来网络 (ICN等) 有合理的地方
 - + 相应思路可以用于促进下一代CDN的研究
- × 4) 国内IPTV CDN与互联网CDN的融合趋势
 - + IPTV CDN与互联网CDN的异同点
 - + 两者的融合是趋势，国内正在进行
 - + 演进和革命

- × 3) ICN, NDN, SCN and so on
 - + - the future network forms associated with CDN
 - + - the future network (ICN) has some reasonable place
 - + The corresponding ideas can be used to promote the research of the next generation CDN
- × 4) the convergence trend of IPTV CDN and Internet CDN in China
 - + IPTV - CDN and Internet CDN : Similarities and differences
 - + The integration of the two is a trend, domestic is underway
 - + Evolution and Revolution

OVERVIEW(概述)

- × 5) CDN与 “云”
 - + 云是什么？
 - × IT资源 (计算能力、存储能力、I/O能力等) , IT资源的集中和按需分配
 - × 云的网元设备：服务器
 - + IT资源集中：IT资源的池化
 - + IT资源按需分配：虚拟机 (VM) 和容器；
- × 6) 存储网络
 - + 存储网络的网元设备是：磁盘及其阵列
 - + 三种存储网络：
 - × 直连式存储 (DAS : Direct Attached Storage)
 - × 网络存储设备 (NAS : Network Attached Storage)
 - × 存储网络 (SAN : Storage Area Network)

- ×5) CDN and the cloud"
 - +What is the cloud.
 - ×IT resources (computing power, storage capability, I/O capability, etc.), IT resource centralization and on-demand allocation
 - ×Cloud network element device: Server
 - +IT resource concentration: pooling of IT resources
 - +IT resource on-demand allocation: virtual machines (VM) and containers;
- ×6) storage network
 - +The network element of the storage network is the disk and its array
 - +Three storage networks:
 - ×DAS:Direct Attached Storage
 - ×NAS:Network Attached Storage
 - ×SAN:Storage Area Network

OVERVIEW(概述)

- × 运营商网络边缘节点
 - + 基础网络设备
 - + “云”化数据中心
 - + 存储网络
- × 边缘计算、边缘存储和cache
 - + 边缘计算
 - + 边缘存储和cache
- × CDN与云的关系
 - + 云可以是CDN中IT资源的计算资源的供应者
 - + CDN的存储资源主要依靠存储网络
- × - operator network edge node
 - + basis of network equipment
 - + The "cloud" data center
 - + The storage network
- × Edge - edge computing, storage and cache
 - + The edge computing
 - + The edge storage and cache
- × The relationship between CDN and cloud.
 - + The computing resources in the CDN \ \ IT resource providers
 - + CDN storage rely mainly on the storage network

PROBLEMS(问题)

- × 1) CDN技术
 - + 内容分发 (非实时业务 , 如 : Web网站)
 - × 下行 : 点到多点 , 就近服务 , 资源均衡
 - × 上行 : 信息检索
 - + 回源技术 (实时 : 如游戏)
 - × 用户与源站 , 点到点通信
 - × 可管控的数据网技术
 - × 技术发散 , 种类繁多 , 考虑解决层面的合理性
 - + CDN是重叠网形态的网络 , 与下层网络资源控制和耦合

- × 1) CDN Technology
 - + Content distribution (non real time service, such as: Web website)
 - × The downside: point to point, the nearest service, resource balance
 - × The uplink: Information Retrieval
 - + Back to the source technology (real-time as games)
 - × The user and the source station, point-to-point communication
 - × Manageable and controllable Data network technology
 - × The technology of divergence, variety, solve the rationality level
 - + CDN is overlay form of network, and lower cyber source control and coupling

PROBLEMS(问题)

- × 2) 边缘存储节点的下沉与移动性
 - + 边缘存储节点的下沉 (减小传输冗余, 提高响应速度)
 - + 移动性问题的根源 (IP地址的分配)
 - + 需要考虑的问题

- × 2) the subsidence and mobility of edge storage nodes
 - + Sink - edge storage node (decrease transmission redundancy, improve response speed)
 - + The root - mobility problems (IP address allocation)
 - + Need to consider the issue of.

PROBLEMS(问题)

× 3) 安全和可信

- + 不可信的根源（网络透明），网络没有采用可信设计
- + 目前的措施：打补丁，加密技术
- + 加密技术（HTTPS等）带来的问题

× 3) safe and reliable

- + - untrusted root (network transparent), without the use of trusted network design
- + - the current measures: patch, encryption technology
- + - Encryption Technology (HTTPS) problems

PROBLEMS(问题)

× 4) DRM、商业模式与相关技术

+ DRM与CDN是解耦独立存在的

+ DRM与商用模型相关联

× 直销

× 分销

× 批发和零售

+ DRM

× CDN中DRM的接入

× 边缘计算和边缘处理

× 4) DRM, business models and related technologies

+ - DRM and CDN are independent of the existence of decoupling

+ DRM - associated with commercial model

× The direct selling

× The distribution

× The wholesale and retail

× - DRM

+ The CDN DRM access

+ The edge computing and edge processing

PROBLEMS(问题)

× 5) 传输资源调度技术手段 (用户体验)

- + 下层传输网络 (传送网与数据网) 的可知、可管、可控
- + CDN对下层网络资源的感知和控制
- + 接口和协议

× 5) transmission resource scheduling techniques (user experience)

- + - the lower transmission network (transmission network and data network) that can be controlled tube.
- + CDN - sensing and control of the lower of the cyber source
- + - interface and protocol

PROBLEMS(问题)

× 6) CDN与接入网的关联性

- + 视频用户体验 = CDN + 接入网能力
- + 接入网技术 (无连接 , 确定性)
- + CDN下沉 , IP寻址

× 6) the connection between CDN and access network

- + - VIDEO user experience = CDN+ access network capacity
- + - access network technology (connectionless, deterministic)
- + - CDN sink, IP addressing

TRENDS(趋势和方向)

× 1) 可信和安全

+ 可信

- × 网络的可信设计
- × 安全技术
- × 加密技术
 - * 加密与执法监听
 - * 密钥管理

+ 安全

- × ○ 网络安全
- × ○ 应用安全

× 1) Trust and security

+ Trust

- × Design of trusted network.
- × - Security Technology
- × The encryption technology
 - * Encryption and Law enforcement monitoring
 - * key management

+ security (Safety)

- × Network security
- × Application Security

TRENDS(趋势和方向)

× 2) 移动性

- + 应用级移动 (蜂窝网的技术)
- + 网络级的移动
- + 移动网络骨干网的下沉

× 2) mobility

- + - application level mobile (cellular network technology)
- + The mobile network level.
- + Sink - mobile network backbone network

TRENDS(趋势和方向)

- × 3) 网络虚拟化和网元虚拟化
(组网技术)
 - + '云化' 数据中心, 重构的运营商网络节点
 - + 网元虚拟化与CDN
 - + 网络虚拟化

- × 3) network virtualization and network element Virtualization (Networking Technology)
 - + - "cloud" data center operators, network node reconstruction
 - + Network element virtualization and CDN.
 - + Network virtualization.

TRENDS(趋势和方向)

- ✘ 4) CDN + 接入网的资源管控及视频用户体验
 - + CDN中的资源管控技术（内容分发，回源，上下层间耦合）
 - + 接入段的资源管控技术
 - + 视频用户体验联盟及作用

- ✘ 4) CDN and access network resource management , video user experience
 - + - CDN resource management technology (content distribution, back to the source, the coupling between the upper and lower)
 - + The access control technology resources.
 - + - VIDEO user experience and the role of alliance

TRENDS(趋势和方向)

- × 5) 融合通信网络
 - + CDN重迭网形态，无自身基础网
 - + 数据网：无数据分发能力
 - + 融合承载网 = 数据网 + CDN
 - × 边缘存储
 - × CDN与数据网协同设计

- × 5) converged communication network
 - + - CDN overlay network forms, without its basic network
 - + - Data Network: no data distribution capabilities
 - + - data network CDN = fusion network
 - × - edge storage
 - × - CDN and data network collaborative design

CONCLUSION(结束语)

- × CDN重要性日益增加
- × 问题日益凸现
- × 下一代CDN发展与研究正当时

- × The increasing importance of CDN.
- × - problems
- × - the next generation of CDN development is the time

THANKS
谢谢！

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