Challenges in Network Game Design and Operation:
An Industrial Perspective

ZILLIANS

Mark Sung
General Manager
mark@zillians.com

Mobile Online Gaming

❖ We aimed to support PC/mobile/web platforms

❖ For mobile online gaming
  - ❖ Context-aware power saving
  - ❖ P2P networking to save bandwidth and improve game-play
  - ❖ Optimized synchronization in intermittent connection state

Real-time Analytic for MMO

❖ Cloud-based Online Game Analysis in Real-time
  - ❖ Traffic Analysis
  - ❖ User Behavior Analysis
  - ❖ Cheating Analysis
  - ❖ Fraud Analysis

❖ Make use of many-core architecture for data-intensive analysis
  - ❖ Parallel String Pattern Matching
  - ❖ GPU-assisted Data Warehousing

❖ We use no VM but implement our own sandbox
  - ❖ VM are really bad for performance
  - ❖ Many-core processors provide almost zero memory protection
  - ❖ Compile-time virtualization to make consolidation while keep instances isolated

❖ Network security is crucial to any cloud solution provider
  - ❖ DDoS to game server is common problem
  - ❖ Protocol hacking is trivial, so additional packet verifications are needed while keeping good I/O performance

Dynamic Resource Provisioning

❖ Resource Provisioning in Our Cloud is Challenging

    ❖ Heterogeneous Client Support → Different Gateways

    ❖ Multiple Many-core Architecture Support → Different Kernels

    ❖ No Standard: Do we need one for any cloud?

        ❖ Rackspace OpenStack

        ❖ Oracle Cloud Element Resource Model API

    ❖ Open API: in what form?

        ❖ RESTful Web Service

        ❖ AJAX API

        ❖ Apache Thrift

        ❖ Google Protobuf