

# **Ericsson TV**

## **Project Monaco**

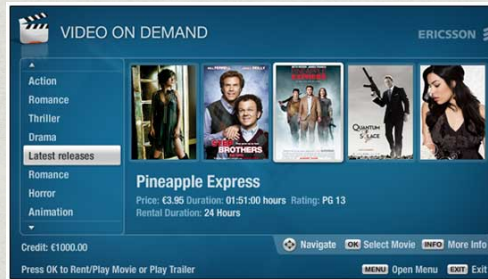
**Brad Anderson - Erlang Factory**  
**March 25, 2011**

# boorad

- \* twitter, github
- \* [brad.anderson@ericsson.com](mailto:brad.anderson@ericsson.com)
- \* Cloudant / BigCouch
- \* Video on Demand
- \* Smart Grid Analytics

# Ericsson TV

- \* Video-On-Demand (VOD) back office software
- \* Customers - Tier 1 telco & cable providers
- \* 10's of millions of VOD sessions per day

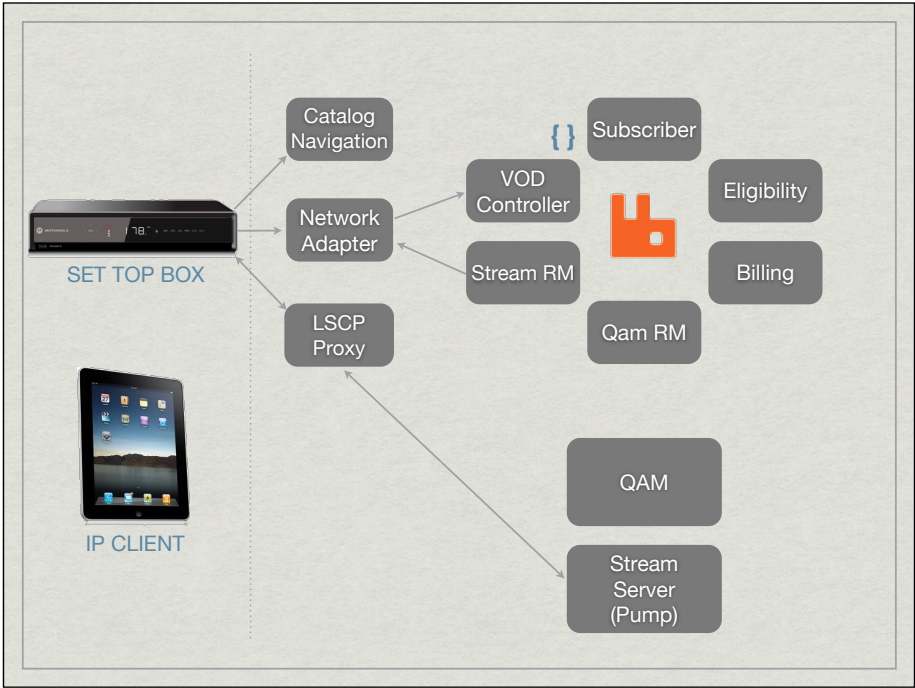


# Project Monaco

- \* Next-Generation Back Office for VOD
- \* Kickoff August 2010
- \* Goals
  - \* Centralized
  - \* Scalable
  - \* Available
  - \* Adaptable

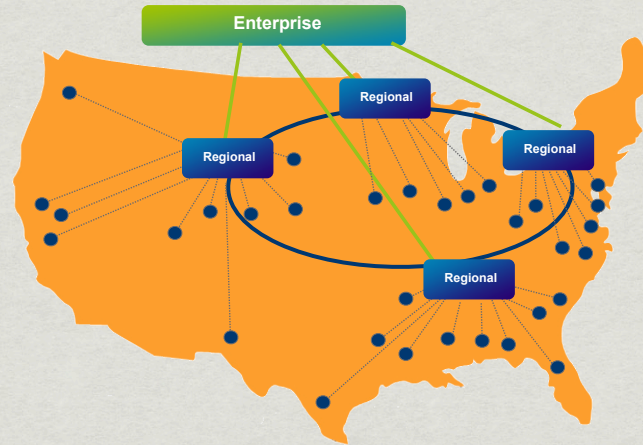
# Erlang

- \* Network Protocols
- \* Message Queue
- \* Distribution / Linear Scaling
- \* Failover



Goals

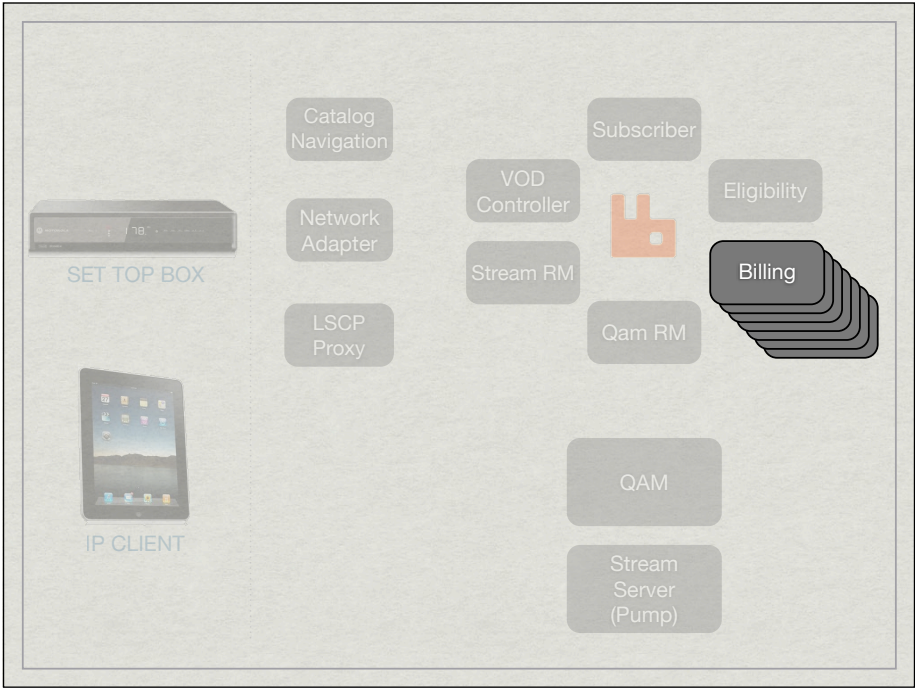
# Regional Consolidation



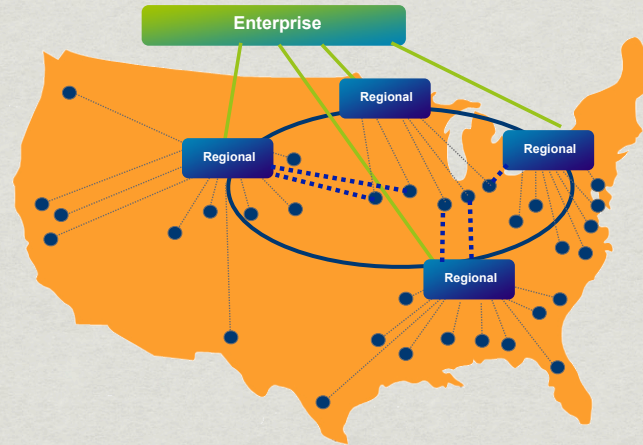


# Scalable

- \* Horizontally Scaling of Components
- \* Virtualization
- \* Distributed Erlang



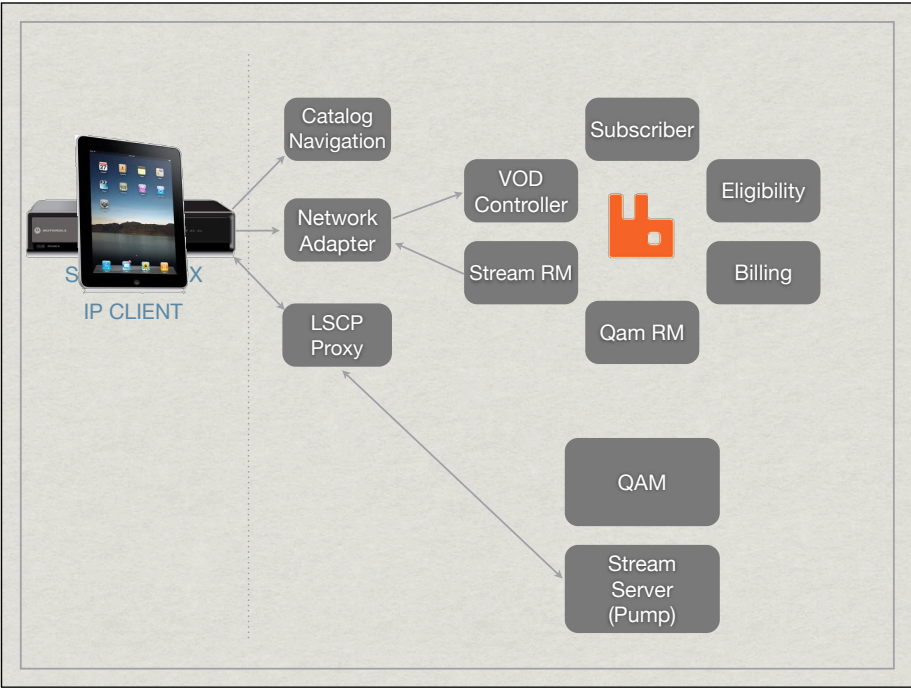
# Available



# Adaptable

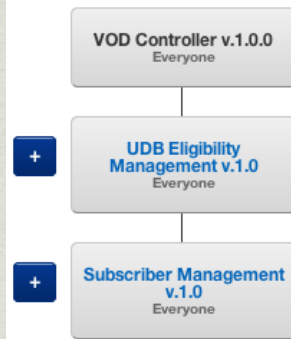
- \* Distinct Components
- \* Pluggable, Flexible Routing
- \* Filtering





# Adaptable

## MOD SETUP



# Protocols

- \* LSCP - Lightweight Stream Control Protocol
- \* RTSP - Real Time Streaming Protocol
- \* DSMCC - Digital Storage Media Command and Control

# Protocols

```
%% extract parts of proxy header
proxy_parts(<<_:16,
            -:8,
            STBID:40,
            HeadendID:16,
            PumpIP:32,
            PumpPort:16,
            _/binary>>) ->
{proxy_parts, STBID, HeadendID, PumpIP, PumpPort}.
```

300 LINES -> 8 LINES



# Troubleshooting

```
0117-06-21 08:08:08.115 INFO org.apache.hadoop.hbase.master.RootScanner: Scan one META region [server:
192.168.14.3:62544, regionName= META_..1, startKey= <>]
java.net.SocketTimeoutException: 30000 millis timeout while waiting for channel to be ready for connect.
ch = java.nio.channels.SocketChannel[connection-pending remote/192.168.14.3:62544]
at org.apache.hadoop.net.SocketIOWithTimeout.connect(SocketIOWithTimeout.java:213)
at org.apache.hadoop.net.NetUtils.connect(NetUtils.java:484)
at org.apache.hadoop.hbase.ipc.HBaseClientConnection.setupStreams(HBaseClient.java:388)
at org.apache.hadoop.hbase.ipc.HBaseClient.getConnection(HBaseClient.java:842)
at org.apache.hadoop.hbase.ipc.HBaseClient.call(HBaseClient.java:715)
at org.apache.hadoop.hbase.ipc.HBaseRPCInvoker.invoke(HBaseRPCInvoker.java:333)
at $Proxy1.openScanner(Unknown Source)
at org.apache.hadoop.hbase.master.BaseScanner.scanRegion(BaseScanner.java:177)
at org.apache.hadoop.hbase.master.RootScanner.scanMetaRegion(RootScanner.java:29)
at org.apache.hadoop.hbase.master.MaintScanner.maintainanceScan(MaintScanner.java:129)
at org.apache.hadoop.hbase.master.RootScanner.run(RootScanner.java:153)
at org.apache.hadoop.hbase.Chore.run(Chore.java:68)
0118-06-21 08:08:08.115 INFO org.apache.hadoop.hbase.master.BaseScanner: Scan ROOT region
java.net.SocketException: Host is down
at sun.io.ch.net.connect(Native Method)
at sun.io.ch.SocketChannelImpl.connect(SocketChannelImpl.java:587)
at org.apache.hadoop.net.SocketIOWithTimeout.connect(SocketIOWithTimeout.java:192)
at org.apache.hadoop.net.NetUtils.connect(NetUtils.java:484)
at org.apache.hadoop.hbase.ipc.HBaseClientConnection.setupStreams(HBaseClient.java:388)
at org.apache.hadoop.hbase.ipc.HBaseClient.getConnection(HBaseClient.java:843)
at org.apache.hadoop.hbase.ipc.HBaseClient.call(HBaseClient.java:715)
at org.apache.hadoop.hbase.ipc.HBaseRPCInvoker.invoke(HBaseRPCInvoker.java:333)
at $Proxy1.openScanner(Unknown Source)
at org.apache.hadoop.hbase.master.BaseScanner.scanRegion(BaseScanner.java:177)
at org.apache.hadoop.hbase.master.RootScanner.scanRootScanner(RootScanner.java:14)
at org.apache.hadoop.hbase.master.RootScanner.maintainanceScan(RootScanner.java:79)
```

```
{
  "session": {
    "id": "abcdefg",
    "routing": [
      "vod_controller",
      "billing",
      "qam_rm",
      "stream_rm"
    ],
    "componentData": {
      "billing": {
        "a": "b",
        "c": "d",
        "e": "f"
      },
      "qam_rm": {
        "a": "b",
        "c": "d",
        "e": "f"
      }
    }
  }
}
```

# Development Stack

- \* rebar
- \* gen\_bunny
- \* emongo
- \* mochiweb
- \* meck
- \* ibrowse
- \* erldis
- \* log4erl
- \* jpath
- \* gen\_monaco\_session

## gen\_monaco\_session

```
-spec handle_session_doc(session_doc()) ->  
  {ok, json_object()} | {error, completion_code()} | no_return().
```

## Early Returns

- \* 4x throughput gains after preliminary stress test
- \* 25% improvement in latency
- \* comically reduced memory footprint
- \* order of magnitude code shrinkage
- \* rapid development of new components

# Rough Edges

- \* Startup/Shutdown (\*nix daemon)
  - \* run\_erl, erl\_exec
  - \* os pid to monitor?
  - \* epmd
- \* Releases
- \* Build System

# Java -> Erlang

- \* Rewriting Codebase
- \* Lunch & Learn
- \* OTP Book Study
- \* Behavior

Questions?