

# Merit Member Meeting

IP Long Distance Services  
21-June-2005



University of Michigan

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# System Statistics

- 38K TDM dial tone lines (2 systems)
- 1.5K VoIP dial tone lines (3 systems)
- 23K Voicemail subscribers (3 systems)

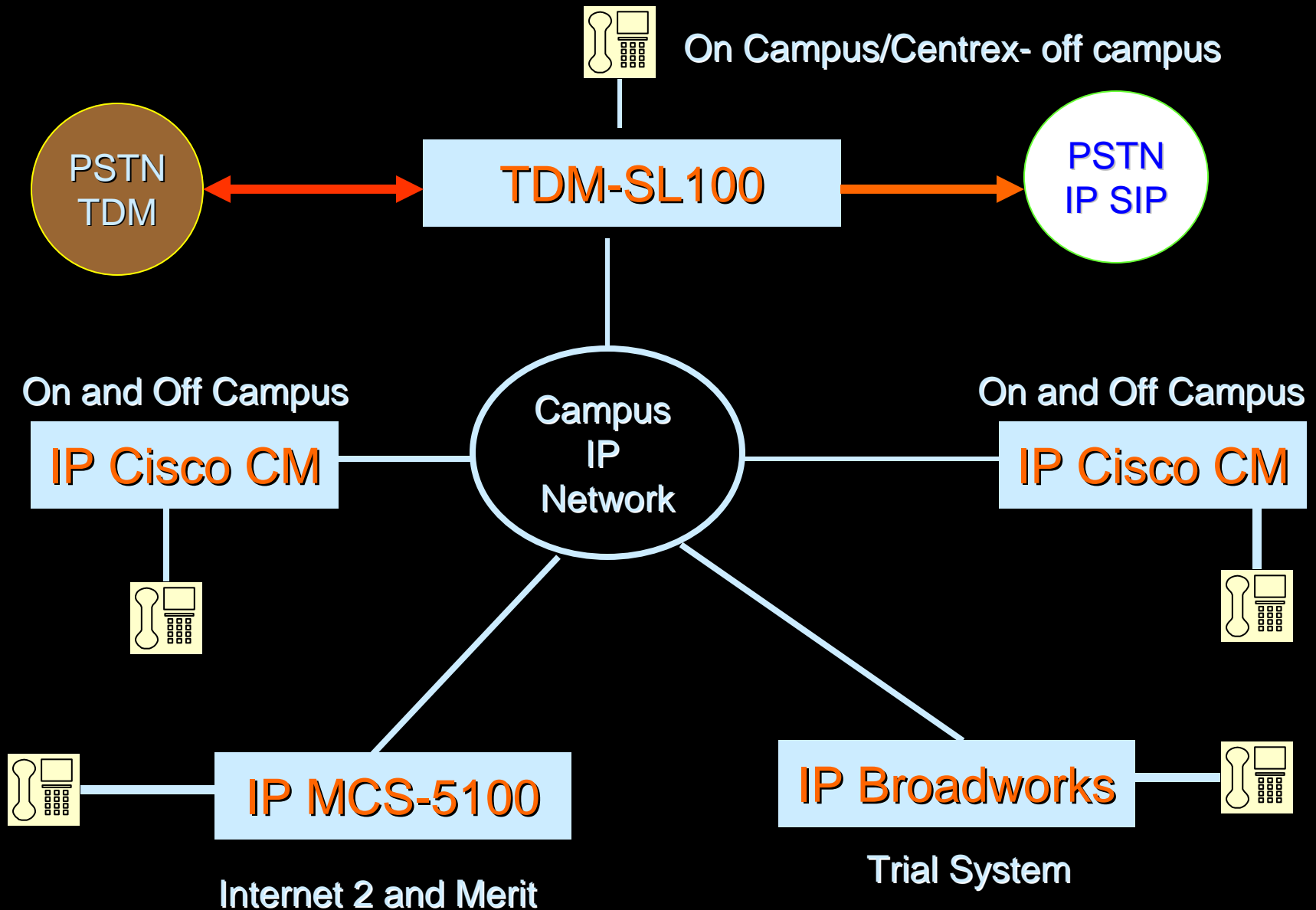
## Average Daily Call Volume

- 120K incoming calls
- 130K outgoing calls
- 1.8 CCS

## T1/PRI Connects

- Qwest = 4
- Voex = 8 (IP)
- ATT = 1
- Sprint = 1
- McLeod = 4
- SBC = 41

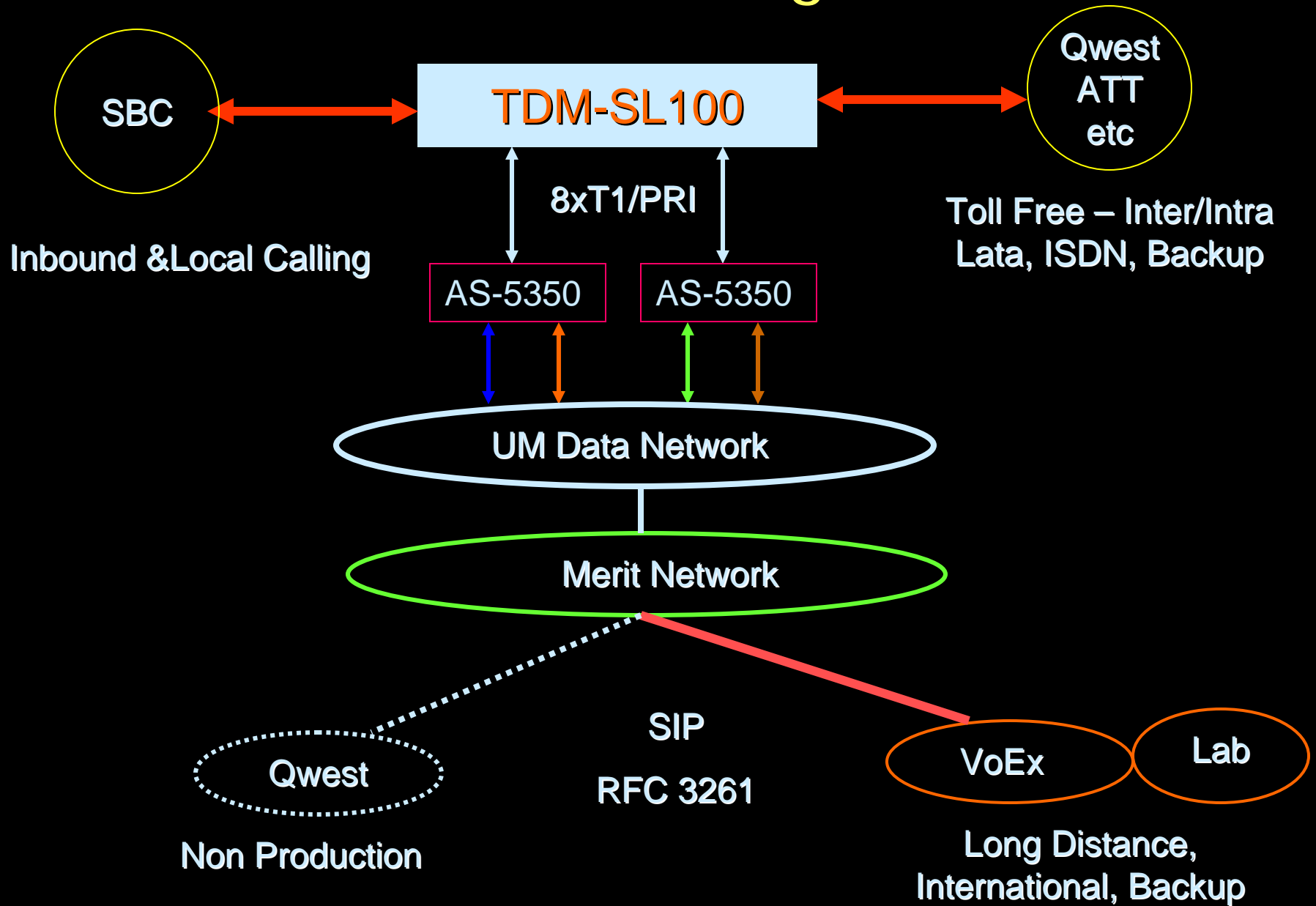
# Campus Voice Service Model



# Benefits

- Cost saving
- Traffic engineering
- SIP infrastructure for integrated services
- Better diagnostic capabilities
- Utilize common routing directory services
- No termination hardware required to Campus SIP Servers

# Call Routing



## Summary

All times are listed in EST/EDT

Values at last update:

**bits in** (for 24 hours):      **bits out** (for 24 hours):

**Cur:** 1.19 Mbits/sec      **Cur:** 2.31 Mbits/sec

**Avg:** 664.03 kbits/sec      **Avg:** 1.29 Mbits/sec

**Max:** 2.18 Mbits/sec      **Max:** 4.17 Mbits/sec

Last updated at Tue Jun 21 09:52:10 2005

*Time Ranges:*

[Daily](#)

[ [Weekly](#) ]

[Monthly](#)

[Yearly](#)

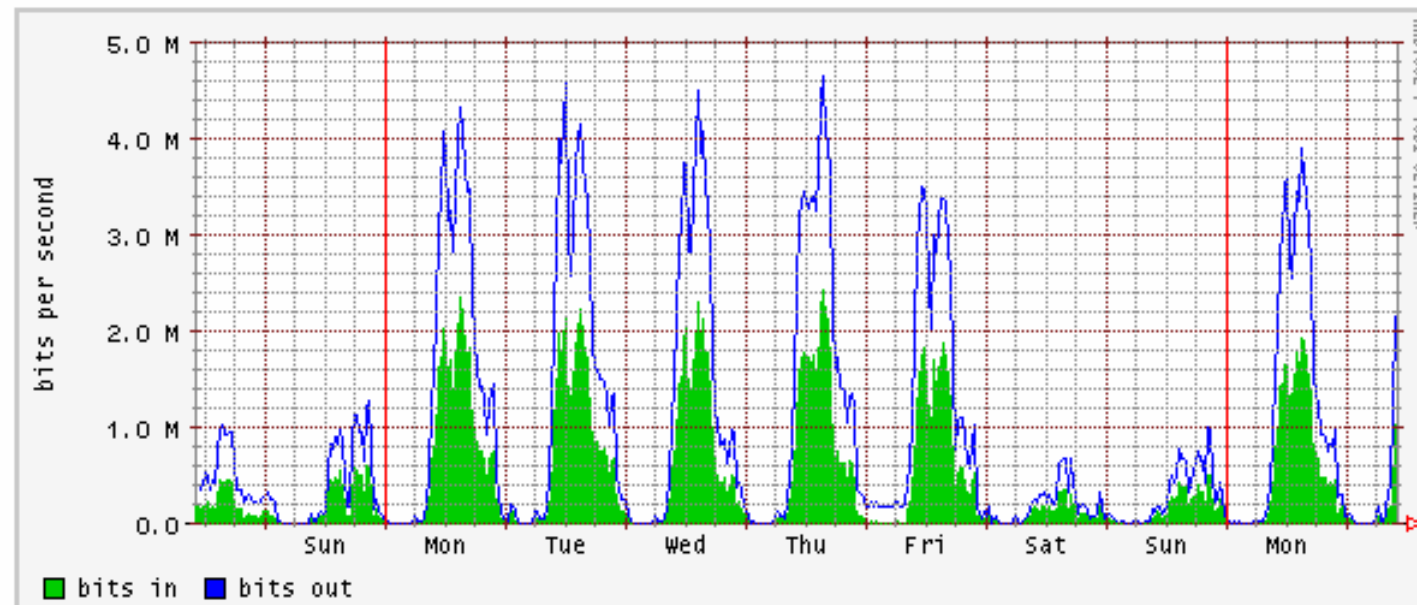
[Short-Term](#)

[Long-Term](#)

[All](#)



## Weekly graph



# Average Daily Call Volume Per Hour

| Hour          | Calls        | Errors      | Minutes      | ASR       | Avg PDD (msec) | Avg DUR               | First Call                           | Last Call                            |
|---------------|--------------|-------------|--------------|-----------|----------------|-----------------------|--------------------------------------|--------------------------------------|
| 2005-06-13 23 | 16           | 3           | 12           | 81        | 1937           | 0 mins 58 secs        | 06/13/2005 23:02:56 GMT-04:00        | 06/13/2005 23:48:18 GMT-04:00        |
| 2005-06-13 22 | 41           | 12          | 85           | 70        | 3394           | 2 mins 56 secs        | 06/13/2005 22:03:04 GMT-04:00        | 06/13/2005 22:59:38 GMT-04:00        |
| 2005-06-13 21 | 911          | 236         | 490          | 74        | 1628           | 0 mins 43 secs        | 06/13/2005 21:00:03 GMT-04:00        | 06/13/2005 21:59:52 GMT-04:00        |
| 2005-06-13 20 | 1307         | 355         | 517          | 72        | 1677           | 0 mins 32 secs        | 06/13/2005 20:00:57 GMT-04:00        | 06/13/2005 20:59:57 GMT-04:00        |
| 2005-06-13 19 | 1116         | 298         | 457          | 73        | 1705           | 0 mins 33 secs        | 06/13/2005 19:00:03 GMT-04:00        | 06/13/2005 19:59:47 GMT-04:00        |
| 2005-06-13 18 | 1233         | 335         | 668          | 72        | 1789           | 0 mins 44 secs        | 06/13/2005 18:00:04 GMT-04:00        | 06/13/2005 18:59:59 GMT-04:00        |
| 2005-06-13 17 | 465          | 92          | 1315         | 80        | 1938           | 3 mins 31 secs        | 06/13/2005 17:00:39 GMT-04:00        | 06/13/2005 17:59:57 GMT-04:00        |
| 2005-06-13 16 | 746          | 103         | 2408         | 86        | 2130           | 3 mins 44 secs        | 06/13/2005 16:00:02 GMT-04:00        | 06/13/2005 16:59:59 GMT-04:00        |
| 2005-06-13 15 | 774          | 112         | 2418         | 85        | 1963           | 3 mins 39 secs        | 06/13/2005 15:00:02 GMT-04:00        | 06/13/2005 15:59:48 GMT-04:00        |
| 2005-06-13 14 | 859          | 137         | 3179         | 84        | 1973           | 4 mins 24 secs        | 06/13/2005 14:00:01 GMT-04:00        | 06/13/2005 14:59:59 GMT-04:00        |
| 2005-06-13 13 | 723          | 101         | 2395         | 86        | 1986           | 3 mins 51 secs        | 06/13/2005 13:00:04 GMT-04:00        | 06/13/2005 13:59:56 GMT-04:00        |
| 2005-06-13 12 | 601          | 79          | 2066         | 86        | 2317           | 3 mins 57 secs        | 06/13/2005 12:00:03 GMT-04:00        | 06/13/2005 12:59:53 GMT-04:00        |
| 2005-06-13 11 | 726          | 99          | 3005         | 86        | 2045           | 4 mins 47 secs        | 06/13/2005 11:00:00 GMT-04:00        | 06/13/2005 11:59:58 GMT-04:00        |
| 2005-06-13 10 | 743          | 118         | 2417         | 84        | 2187           | 3 mins 52 secs        | 06/13/2005 10:00:00 GMT-04:00        | 06/13/2005 10:59:57 GMT-04:00        |
| 2005-06-13 09 | 564          | 144         | 1434         | 74        | 2012           | 3 mins 24 secs        | 06/13/2005 09:00:03 GMT-04:00        | 06/13/2005 09:59:55 GMT-04:00        |
| 2005-06-13 08 | 238          | 47          | 730          | 80        | 2220           | 3 mins 49 secs        | 06/13/2005 08:00:43 GMT-04:00        | 06/13/2005 08:59:56 GMT-04:00        |
| 2005-06-13 07 | 51           | 16          | 82           | 68        | 2650           | 2 mins 21 secs        | 06/13/2005 07:08:53 GMT-04:00        | 06/13/2005 07:57:53 GMT-04:00        |
| 2005-06-13 06 | 10           | 3           | 13           | 70        | 1286           | 1 mins 58 secs        | 06/13/2005 06:09:30 GMT-04:00        | 06/13/2005 06:59:18 GMT-04:00        |
| 2005-06-13 05 | 23           | 5           | 19           | 78        | 1224           | 1 mins 3 secs         | 06/13/2005 05:37:31 GMT-04:00        | 06/13/2005 05:51:54 GMT-04:00        |
| 2005-06-13 04 | 1            | 0           | 3            | 100       | 4466           | 3 mins 39 secs        | 06/13/2005 04:05:39 GMT-04:00        | 06/13/2005 04:05:39 GMT-04:00        |
| 2005-06-13 03 | 1            | 1           | 0            | 0         | 0              | 0 mins 0 secs         | 06/13/2005 03:22:43 GMT-04:00        | 06/13/2005 03:22:43 GMT-04:00        |
| 2005-06-13 02 | 3            | 1           | 5            | 66        | 5642           | 2 mins 40 secs        | 06/13/2005 02:26:17 GMT-04:00        | 06/13/2005 02:39:45 GMT-04:00        |
| 2005-06-13 01 | 2            | 0           | 1            | 100       | 10525          | 0 mins 49 secs        | 06/13/2005 01:37:20 GMT-04:00        | 06/13/2005 01:41:02 GMT-04:00        |
| 2005-06-13 00 | 3            | 0           | 5            | 100       | 1170           | 1 mins 41 secs        | 06/13/2005 00:08:05 GMT-04:00        | 06/13/2005 00:09:39 GMT-04:00        |
| <b>Total</b>  | <b>11157</b> | <b>2297</b> | <b>23733</b> | <b>79</b> | <b>1937</b>    | <b>2 mins 40 secs</b> | <b>06/13/2005 00:08:05 GMT-04:00</b> | <b>06/13/2005 23:48:18 GMT-04:00</b> |

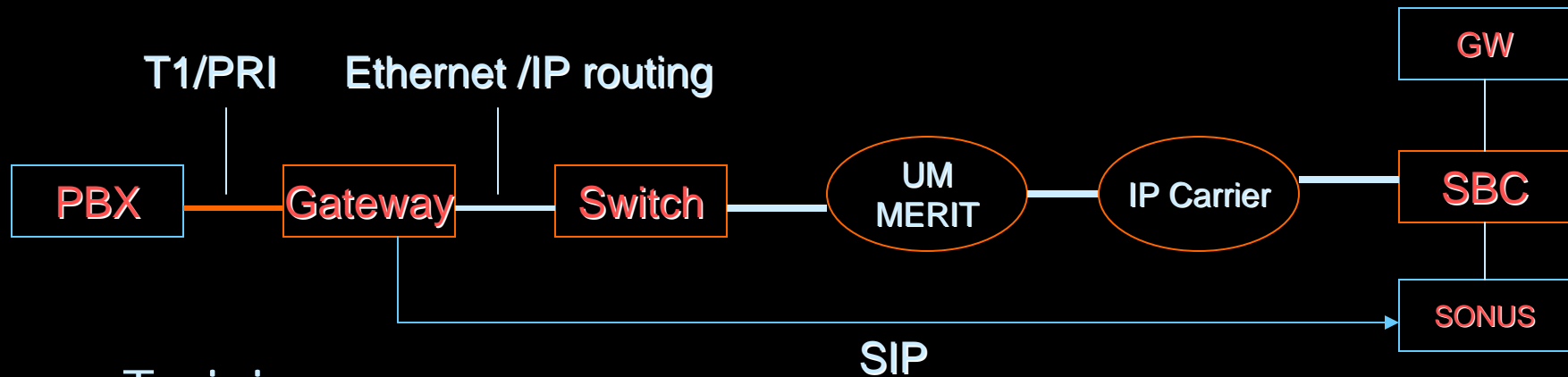
# Average Weekly Call Volume

| Src RegID/Port  | Calls | Errors | Minutes | ASR | Avg PDD (msec) | Avg DUR        | First Call                    | Last Call                     |
|-----------------|-------|--------|---------|-----|----------------|----------------|-------------------------------|-------------------------------|
| UOFM-5350-4-B/0 | 49614 | 9742   | 116108  | 80  | 1944           | 2 mins 54 secs | 06/13/2005 00:08:05 GMT-04:00 | 06/17/2005 22:58:35 GMT-04:00 |
| Total           | 49614 | 9742   | 116108  | 80  | 1944           | 2 mins 54 secs | 06/13/2005 00:08:05 GMT-04:00 | 06/17/2005 22:58:35 GMT-04:00 |

# Call Statistics

| Src RegID/Port  | Code | Calls | Minutes | Avg PDD (msec) | Avg DUR        | First Call                    | Last Call                     |
|-----------------|------|-------|---------|----------------|----------------|-------------------------------|-------------------------------|
| UOFM-5350-4-B/0 | A    | 8108  | 0       | 0              | 0 mins 0 secs  | 06/13/2005 02:39:45 GMT-04:00 | 06/17/2005 22:03:41 GMT-04:00 |
| UOFM-5350-4-B/0 | B    | 1423  | 0       | 0              | 0 mins 0 secs  | 06/13/2005 07:20:21 GMT-04:00 | 06/17/2005 22:41:33 GMT-04:00 |
| UOFM-5350-4-B/0 | E    | 211   | 0       | 0              | 0 mins 0 secs  | 06/13/2005 09:06:16 GMT-04:00 | 06/17/2005 21:06:21 GMT-04:00 |
| UOFM-5350-4-B/0 | N    | 39872 | 116108  | 1944           | 2 mins 54 secs | 06/13/2005 00:08:05 GMT-04:00 | 06/17/2005 22:58:35 GMT-04:00 |

# Challenges

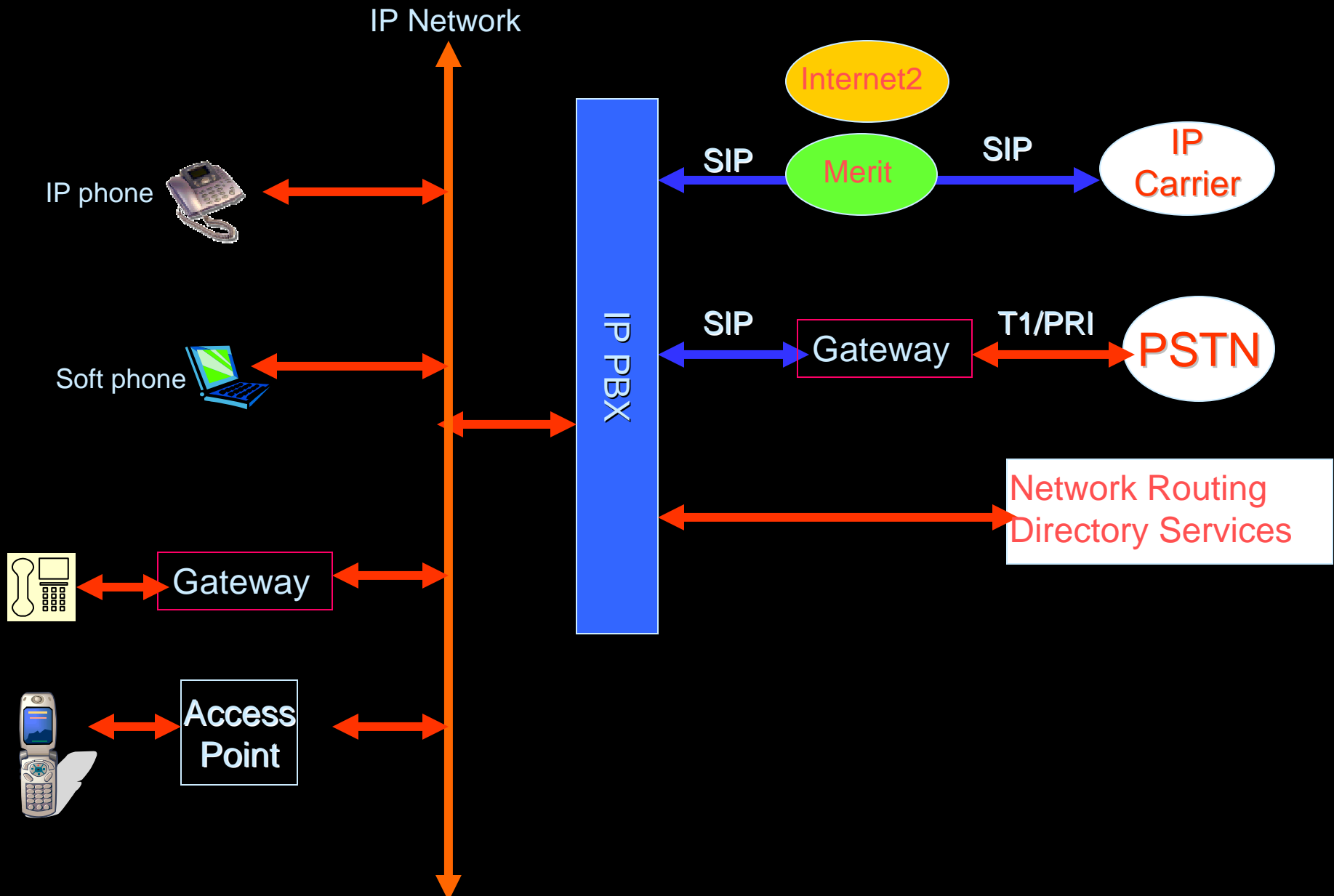


- Training
- Stateless connection design challenges
- ISDN and SIP timers
- End to End diagnostics consideration
- Integrated Management
- Redundancy issues
- Quality assurance policy
- Network Security policy
- B channel bonding issues
- Fax and Modem challenges

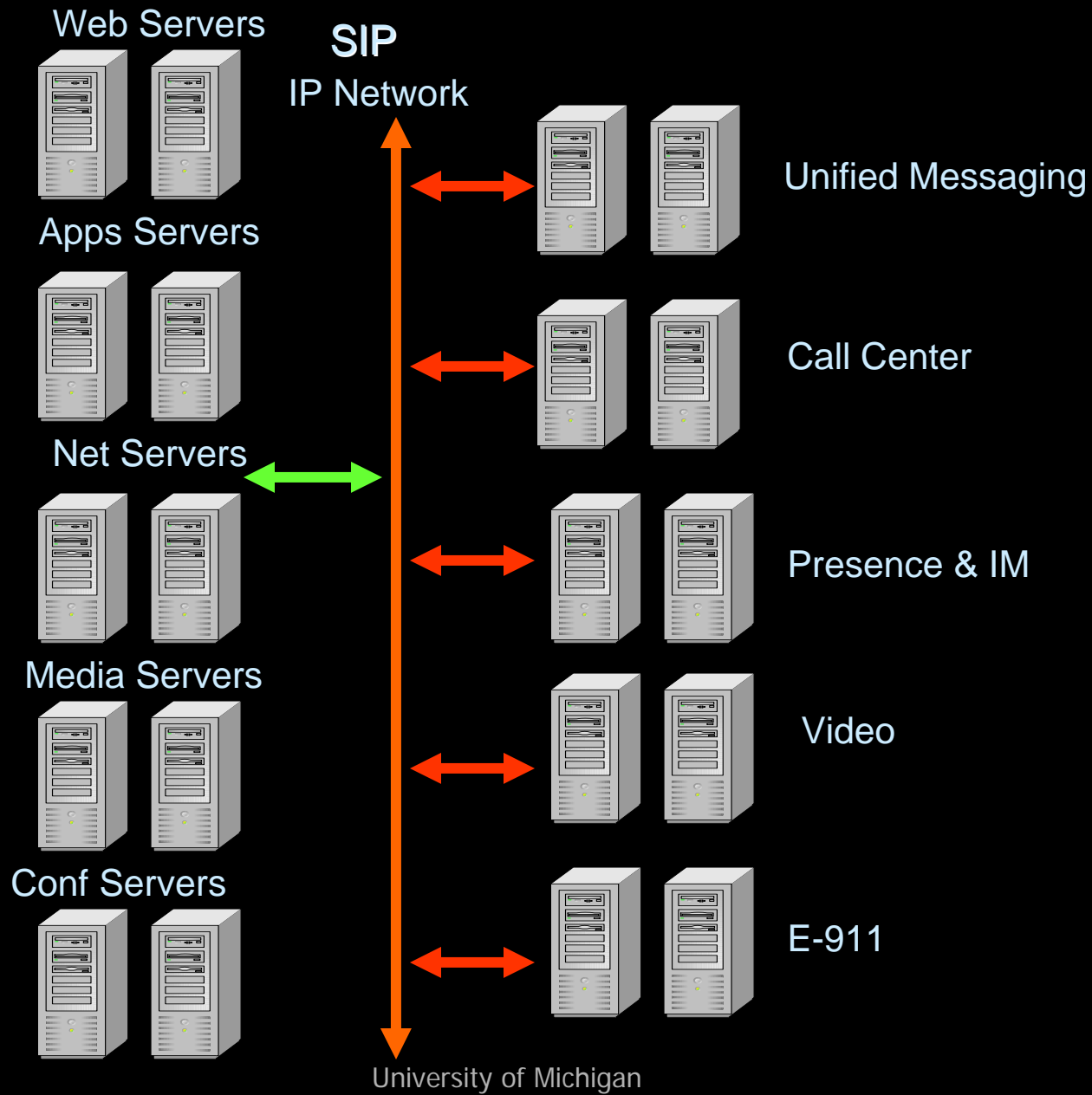
# Abandoned Call

|  |                                       |                                  |                             |                        |                |                     |
|--|---------------------------------------|----------------------------------|-----------------------------|------------------------|----------------|---------------------|
| Date: 06/17/2005<br>22:03:41 GMT-04:00   |                                       | Time Zone: EDT                   | Duration: 0                 | Duration(msec): 0      |                |                     |
| PDD: 3611  | Call Route:                           | Status: 1                        | Status Desc: rater.mode=raw |                        |                |                     |
| User ID:   | Call Type: IV                         | Region Code:                     | Disconnect Code: A          |                        |                |                     |
| Origination  |                                       |                                  | Termination                 |                        |                |                     |
| Reg UOFM-<br>ID: 5350-<br>4-B  | IP: 198.108.8.1                       | Dialed: 12024928720              | =>                          | Reg ****-<br>ID: ****_ | IP: ***,**,*.* | Dialed: 12024928720 |
| Source Q.931 Port: 0   | Orig Port: 0                          | Term Port: 0                     |                             |                        |                |                     |
| Err ID: 2  | Err Desc: abandoned                   | Err ID: 0                        | Err Desc:                   |                        |                |                     |
| Src /home/nextone/cdrs/T200506180105.CDT<br>File:  |                                       | Src Line: 15135                  | Hold Time: 28               |                        |                |                     |
| Created: 06/17/2005<br>22:04:20<br>GMT-04:00   | Last Modified: 2005-06-17<br>22:04:20 | Last Call Number: 53712024928720 | Number After Transit:       |                        |                |                     |
| Sequence Num: 22324601   | Protocol: sip                         | Hunt Attempts: 1                 | ISDN Code: 0                |                        |                |                     |
| Incoming Call ID:  | CDR Type: end1                        | Billable Flag: N                 | Manip Dialed: 12024928720   |                        |                |                     |
| Call ID: 6E2C744-DED411D9-9ABDF9B6-C0AFC9B4@198.108.8.1-4de1f98e506d3780379ac80954a67425 |                                       |                                  |                             |                        |                |                     |
| H.323 RAS Error: 0   | H.323 Error: H.225 0                  | SIP Final Response Code: 487     | Last Event: 100x-tx#na      |                        |                |                     |
| Origination  |                                       |                                  | Termination                 |                        |                |                     |
| ANI: 7347638234  | Trunk Group:                          | Realm: Public-1                  | =>                          | New ANI: 7346470000    | Trunk Group:   | Realm: Private-1    |
| Country:   | Desc:                                 | Number Type: 0                   |                             | Country:               | Desc:          | Number Type: 0      |

# IP Voice Service Model (2005)



# Next Steps (200X)

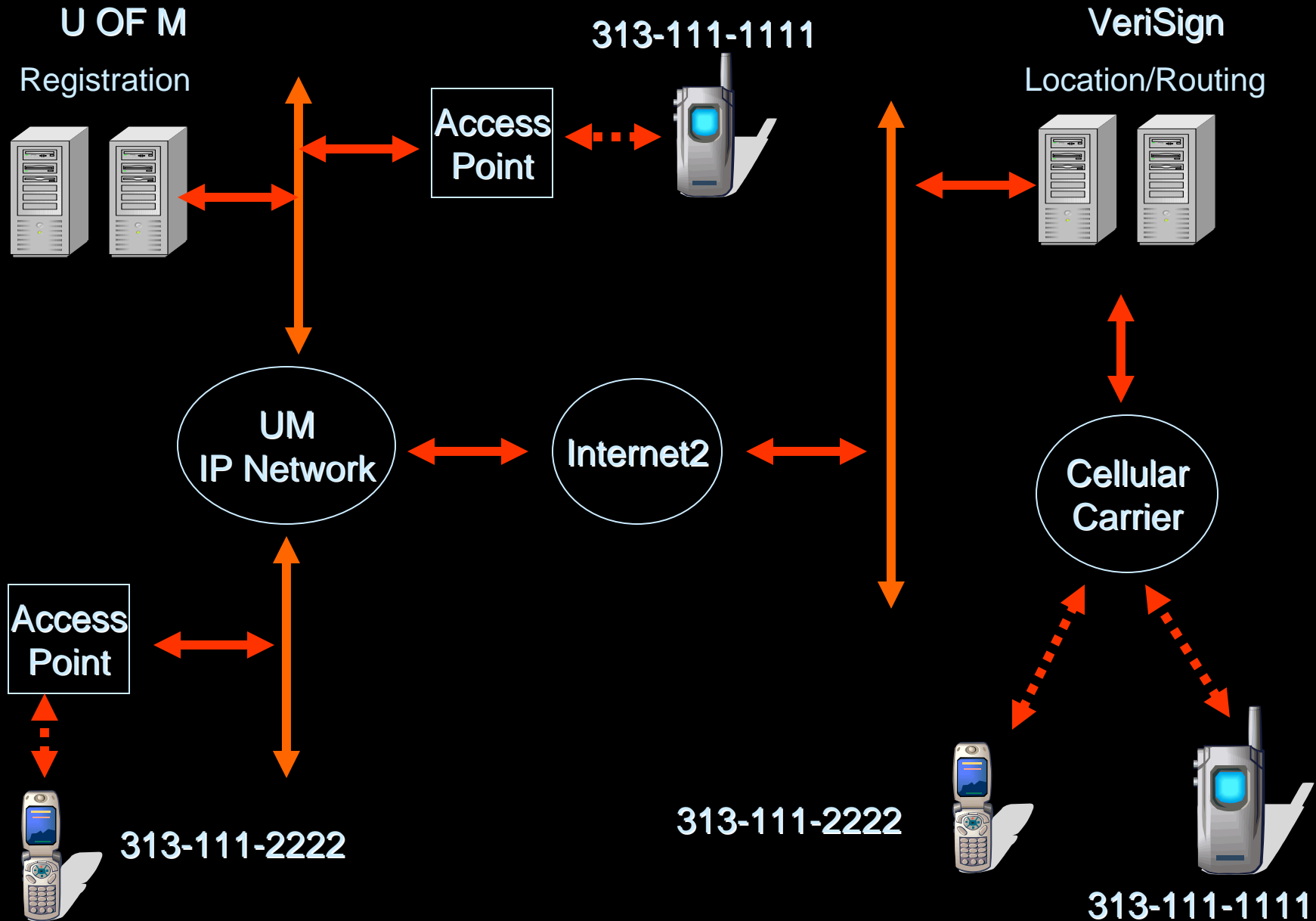


# Next Steps

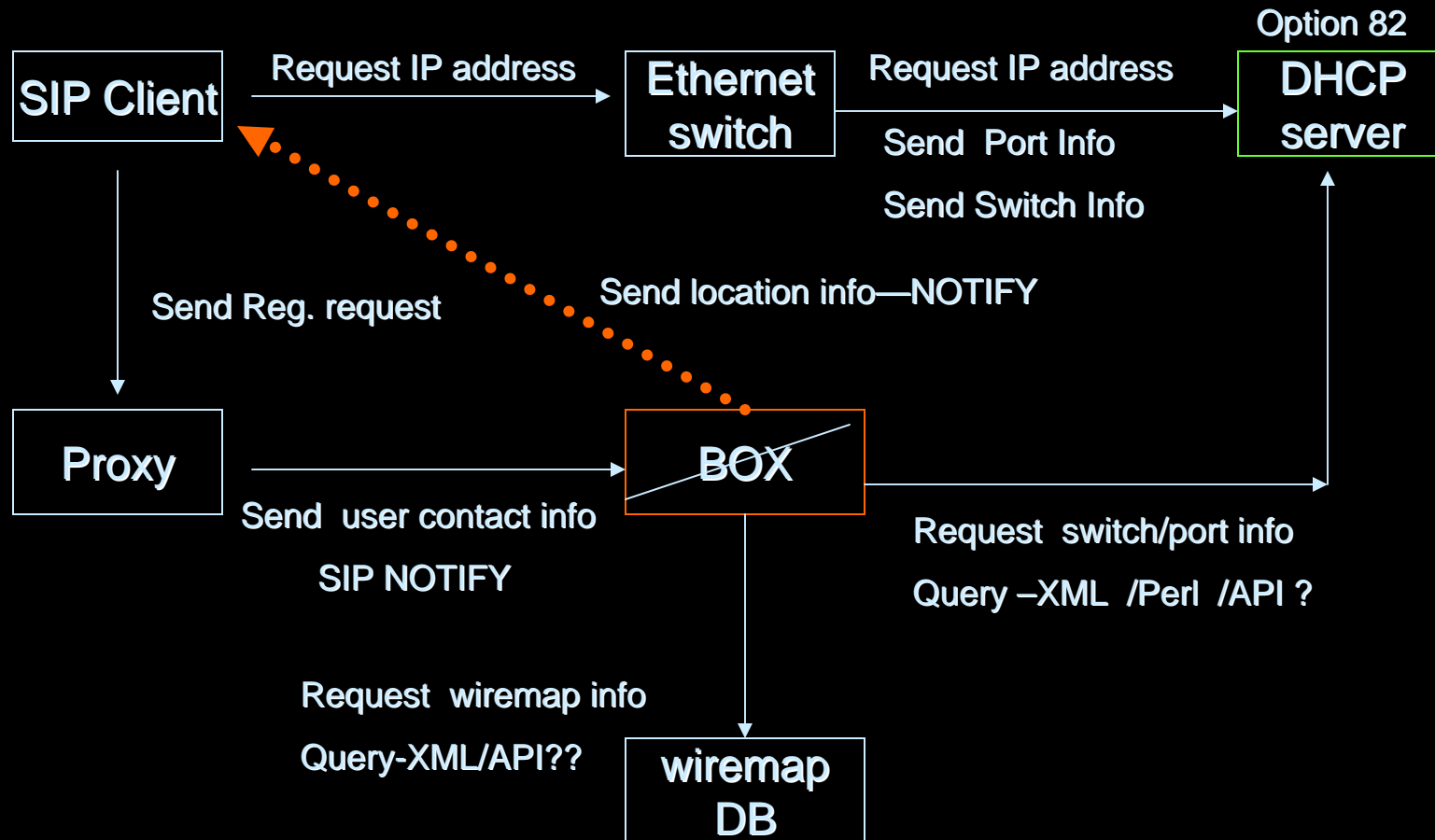
- Integrated diagnostic & alert notification
- Audio Quality Measurement Tool
- Securing signaling and media channels
- Gateway Enhancements
- Call routing between Michigan Universities
- Collaborative applications (IM, Video etc )

# *Question and Answer*

# Cellular, Wireless and SIP (2005)-Research



# E-911 Research



# E-911 Research

