

**From:** Chris Jones  
**Sent:** Sunday, November 23, 1997 6:35 PM  
**To:** IE Project Team  
**Cc:** Chris Jones; IE Executive Team  
**Subject:** Notes from IE 5 Planning Offsite



Offsite Notes.doc

As a follow up to our IE 4 post mortems, and a kick off to IE 5 planning, leads from different teams went offsite last Thursday to talk about IE 5 planning. The goals for the meeting were to:

- Gain an Understanding of the Past (what have we learned?)
- Reach Consensus on IE 5 Goals and Objectives (where are we going?)
- Brainstorm Ideas on What we should Do Differently to both:
  - Address the Past Issues (market, customer, and post mortem feedback), and;
  - Achieve our Goals for IE (customers, team, and market share)

### ***How Do I Find Out More?***

You can get more information by reading the attached notes from the offsite, which will be posted later this week on <http://ie/secure/postmortem>. Also on this page you will find summaries of all the team's post-mortems, plus a summary of information presented at the offsite, including offsite slides and breakout group notes. Please take a look and feel free to send questions, suggestions, or comments to your feature team leads or to anyone on the exec team.

### ***What's Next?***

The most important part of this offsite is what happens next, in follow up and commitment to change on the project. Our next steps from this meeting are:

1. Send summary notes from offsite plus plan for incorporating changes – chrisjo (attached in this mail, will be posted on <http://ie/secure/postmortem>)
2. Review the offsite information and discussions with individual teams – team leads.
3. Have regular, all-team meetings where we review and go over where we are with major issues, plus IE 5 status and schedule – chrisjo.
4. Take recommendations from break out groups and incorporate them into our planning – owners listed below. NOTE: If you have comments or questions on any of these issues, or ideas about how to make them better, please send mail to the owners below.
  - Browser vision – jhenshaw/hadip.
  - Shell vision – joeb/jont.
  - Anti-bloat, both working set and download size – joepe/rodc.
  - Cross platform – chrisjo.
  - Communication and scheduling – hadip/jhenshaw.

Questions? Comments? Let me know.

Thanks -- Chris



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## Morning – Where Have We Been

We spent the morning getting different perspectives on (1) how IE is doing, (2) what the rest of the company is doing, and (3) reflections on IE 4 successes/failures.

### Marketing Update (yusufm)

YusufM spend 20-30 minutes covering IE status from a market perspective.

### What's Going Well

- Our share is growing. In the US, our measurements show ~40% share now, the marketing team's goal is 55% share by Q2 of next year. Outside of the US, our share is even better, over 50% in some countries, with a goal of 65% by Q2 of next year.
  - As a side note, making these goals is very aggressive. While our AOL partnership is really helping in the home, in the corporate space we will have to convert 2.3 million customers to IE. Having a strong, integrated Microsoft message for corporations is critical to this.
- Download demand continues to be strong. 2-3 million people have downloaded IE from the web site.
- IEAK licensing is strong. We have over 20,000 IEAK licensees.

- We are winning all the reviews. We have build a world class product and it shows. We have won every head to head review against Netscape.

### Challenges and Blocking Issues

- Cross platform continues to be a major adoption hurdle. Many corporations and ISP's will not deploy our products until the cross platform products have shipped. Sim shipping a lower featured cross platform product is better than shipping later with more features.
- Performance overall, in particular with integrated shell, is a problem. The IE 4 browser, while fast, is simply too big for customers to install and adopt, both in terms of memory usage (working set), and also in terms of disk footprint (install size). The integrated shell adds additional requirements, and customers are not deploying on 32 MB NT systems.
- Support costs continue to rise. This is a problem for our partners (ISP's and OEM's), and for our customers (bad customer experience).
- Channels are confusing.
- General discoverability and easy of use.

### Top Product Requests from Marketing

- For End Users: Ease of use (simplify!), size and performance, and making it easier to find things on the Web.
- For Corporations: Cross platform sim-ship, sim-ship the IEAK, and remove size/performance issues (working set and install size).

### ***Customer/Competitive Update (jhenshaw/hadip)***

Jeff and Hadi spent the next hour reviewing customer feedback, really focusing on areas we could improve.

### End Users

For the end users, the main complaints were download size, number/complexity of features, number of components, and end to end experience.

- End to end experience. There was a lot of discussion about how to solve the end to end experience and make it really good, and comments that we as a company have a tendency to ignore this and instead deliver great components.

### Corporations

For corporations, the feedback is cross platform, administration, and reducing support costs.

- Office integration. Integration with Office is better than cool, consistency is important to these accounts.
- Less UI change and less complexity. This doesn't mean "don't do feature work," this means do feature work that helps the 90% task, don't reinvent the same feature, and don't clutter the common case with low use features.
- Performance matters. Corporations need software that runs on their existing hardware. This means working set and end to end speed, as well as network utilization and bandwidth.

### Competition

Our competition is driving to deliver complete, compelling experiences for customers.

- Netscape sells a compelling vision as well as a product, has a great integrated message. "Buy Communicator and SuiteSpot, all your needs are met."
- Users are spending less time in Microsoft products. We need to provide compelling solutions that address their business needs today.
- Threat for developers is that HTML 3.2 + Java becomes good enough. We need to provide more compelling solutions that meet their needs. Reach is still critical for these customers.

- Check out [www.visto.com](http://www.visto.com) : basically they give you server space and mail and roaming of your favorites (stored on an http server) and more all available within the browser.
- 40% is 40%. We don't have 80% share. Netscape has been working for 4 months now on Nav 5, we don't know what it is. We need to continue to respect them as a competitor.

### **Post Mortem Feedback (joepe)**

JoePe gave a summary of post mortem feedback and issues. The major project wide issues were communication (top down, laterally, across teams, etc.), focus, ownership, product quality, and too reactive. Joe noted that these are team perceptions, so even if there are places you do not agree, the perception still exists and the issues are real.

### **Communication**

People did not understand how decisions were made and were not informed when they were.

- Specs were sporadic and poor from a dev/test/UE standpoint. Specs need to be clear, complete, and timely. It wasn't always clear who to talk to about issues when they came up.
- Decision-making seemed arbitrary and unclear. It wasn't always clear how decisions got made. People didn't know who to talk to for resolution on internal issues, or who to contact about partner issues. The team overall felt like they weren't involved early enough in the design process.
- War/exec team communication needed improvement. It wasn't clear to the team how and why the exec team made decisions. SDK/UE teams were not brought in early enough in exec decisions. Top down communication (leads to dev/test) was often absent or unclear.

### **Lack of Focus**

It was never clear how our vision mapped to features and customers, resulted in seemingly random decisions.

- Product vision did not map clearly to features or customers. People didn't understand how to prioritize features, and were never clear on why a feature was added. This lack of focus seemed to result in random decisions, either in responding to competition (Netscape), or random UI features.
- Shell vs. browser. Many people commented that they felt torn between these two deliverables, and didn't know how to make decisions or prioritize features.
- Platform/API message. This seemed unclear and not focused, in particular our ICP vs. ISV message.

### **Lack of Clear Ownership**

It wasn't clear who to talk to for resolution or escalation of an issue, and too many things got escalated to the exec team.

- Lack of clear owners for features and team interaction. No good Dev/Test/PM match up at a feature/code level. It was hard to find who owned what. Ownership for external components difficult to determine.
- Cross team features were poorly managed. Who owned Channels? Favorites? Transition effects?

### **Quality Bar Too Low**

Throughout the product and at the end.

- Date driven, not quality driven. This is mostly a reflection that we had too many features for the date we decided on, and we had no ability to move the date or adjust the features to make the project reasonable. The result was that the test team did not have enough time.
- Build quality was overall poor. There were too many self host builds, and too little buddy testing.
- Underlap/overlap between test teams. This relates back to cross team ownership. Some areas of the product were over-tested, while others were not tested at all. Need better ownership/quality across the product in test.

## Reactive, not Proactive

Never felt in control of our destiny or on a steady course.

- Too reactive to NS features/releases. Netcaster reaction is a great example of this.
- Reactive to Windows 98 needs/dates. We often turned 180 degrees to meet their needs. This is not to say we shouldn't have delivered, but we needed to plan better.
- Initially poorly prepared for Security problems (3.02). However, we have improved dramatically in this area.

## Office 9/NT 5 Update (frankar/dhach)

Good presentations from NT and Office. Key priorities for their teams:

- Schedule. Office/NT are both Q3/97, most important feature for them is that we make their dates.
- Performance. Need to figure out how Office + IE + NT fits in 32 MB machine, it doesn't today.
- ZAW/admin. Need to work for consistent story, critical for deployment in corps.
- Publishing/collab integration. Save as HTML, routing documents, viewing documents.

## NT 5 Plans

FrankAr, Director of Program Management from the NT team, discussed NT futures/plans. Top-line points:

- NT 5 goal is to be the corporate desktop, upgrade every corporate machine. This is a huge revenue and business opportunity for the company. We make more per NT license than Win95 license, NT 5 is the vehicle that will compete with the NetPC. Possible upside is 800MM profit.
- Performance, particularly working set, is a critical feature. Need to figure out how to make NT 5 + Office + IE 5 work well in a 32 MB machine. Big challenge for all three teams.
- Not having the latest IE and shell is a disaster for them. Top complaint from their beta customers. The shell is essential to NT 5 success – it is the way their customers access features. The browser is mission critical for business – many of their admin tools and corporate sites leverage the browser. They are eager to work with us to make sure IE 5 is in NT 5 and are very willing to be flexible.

## Questions:

- "How confident are you in your schedule?" A: Frank feels good about August/September for RTM, but NT 5 is a big release so they are really going to play it by ear. He will keep us updated; main thing to focus on is their 4/15/97 Beta 2.
- "How does ZAW work on Win9x/NT 4 boxes?" A: The administration works (profile roaming), intelli-mirror does not. TomY owns action item to follow up, as x-platform administration is super important for us.

## Office Plans

Dhach, Group Program Manager for UI/Simplicity in Office, discussed Office 9 plans. Top points:

- TCO/Admin is critical for them, need to reduce deployment/admin costs.
- Browser is now the Office viewer. HTML is preferred file format. Lots of work we can do here to make this work well in IE 5 browser, they want IE 5 experience to be best.
- Performance a huge concern. With IE on a Win95 machine, they currently start with negative memory and are already swapping on boot.

## Questions:

- "When you save as HTML, do you save one file or a set? Won't customers be confused?" A: Office strategy is to save as multiple files in a directory. This seemed confusing and hard for customers, clearly it is something that the Office folks are struggling with. A big opportunity for the OS to help out here.

- "What is the perf goal for Office 9?" A: Today in 16MB Office 9 apps have negative memory, IE + Shell + OS is simply bigger than 16 MB. Need to work on this cross team. JoePe/RodC own this item from IE team, FrankAr volunteered to have NT perf lab involved.
- Lots of discussion about Office Web Server and collaboration scenarios. Huge opportunity for IE team to integrate with Office and add value.
- Discussion about Office Resource Kit/IEAK integration, how will corporations deploy these. TomY owns follow up.

### **Division Goals and Objectives (chrisjo)**

ChrisJo framed IE opportunities and challenges.

### **Business Trends, and Events**

- Businesses using Internet for applications. Mail/browser are replacing Word as the primary PC application. Web-based solutions are replacing VB/Access/Notes-based solutions. Our IT department is an example, 70% of new apps are Web apps, where 70% used to be VB apps.
- Communication (email/chat) driving consumer PC usage. AOL and WebTV are becoming places people spend more time, the average WebTV user spends 40 hrs/mo on-line (compared to 16 hrs/mo for MSN users).
- "Client-server" solutions moving to Web. Developers who used to use Notes/VB/Access are now writing ASP pages and HTML.
- Reach and TCO are "showstopper" features. Reach > features, essential to deployment of new applications; customers are choosing lowest common denominator solutions. Customers are reluctant to upgrade their desktops; it costs them \$100 per desktop to pay someone to install a new piece of software.

### **Microsoft Challenges**

- Outline and deliver complete solutions for today's end user. We need to create a vision for the corporate user that is compelling. We are too focused on protecting what we have, not in leading to someplace new. Competitors are taking advantage of this; Netscape, Lotus, NetPC have these visions and are winning customers in corporations; AOL has the consumer vision and is winning customers in the home. A big part of this is delivering an end to end, integrated experience, customers make a Microsoft decision, not an IE decision.
- Deliver compelling solutions for developers. Today there is no user difference on the Web between a Microsoft client and a Netscape client, with a couple of exceptions. We need to create a compelling platform for developers that does things that Netscape/others cannot deliver. Risk we have is that ISV's think Java, HTML 3.2 "good enough." Today there is no incentive to target MS platform. We have to deliver real benefit with less cost.

### **Our Role (IE/Shell)**

- Gain Browser Share (chrisjo). Have to deliver complete end user experience, compelling developer platform, with low deployment cost.
- Simplify Windows User Experience (jont/joeb). Lower TCO, combat NetPC, great OS integration.
- Support Microsoft Product Line. Customers want a Microsoft solution, we need to support the big three Microsoft brands; Windows, Office, and BackOffice.

### **Our Strategy**

- Split the browser from the shell, to gain focus. Browser team headed by ChrisJo, shell team headed by JonT/Joeb.
- Best way to gain browser share is to increase our attach rate to Office, leverage Office 9 ship. Note that this doesn't just mean shipping with Office, it means providing customers reasons to use IE with Office.

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- Best way to simplify Windows is to integrate with the OS, ship with NT 5. This is shell team's mission.
- For both, huge opportunity next year is the corporation. Note that this doesn't mean that we only do TCO features, it means that we focus on the corporate end user, corporate IT manager, and corporate MIS developer.

## Afternoon – How Do We Get There

We spent the afternoon talking about how to execute on our strategy, in 5 breakout groups.

- Critique Goals/Vision for Browser/Shell. What do we want customers to say about our product when we ship? What does success look like? Is it compelling? Focus on corporate end user, decision-maker, and MIS developer.  
Browser: Ahimes, mwallent, dhach, kimpar, sanjays, laurent, chrisg  
Shell: Rickse, cdturner, chrisvau, Jont, julianj, rossw, christw, jhenshaw
- TCO; Perf, Anti-bloat, Download vs. Features. How do we reduce install size/footprint by 50%? How do we reduce working set by 50%? How do we motivate/reward people to deliver?  
jaya, rickb, georgest, joepe, rodc, ericeng, mikesh, emilyw
- Cross Platform/Reach. Why do customers want this? How do we address the customer demand for cross platform support? How do we create a compelling Microsoft platform for customers to target? What is our role?  
Kirksc, hillelc, yusufm, brendand, jenk, scotthy, jobc, gerald
- Planning/Schedule. What is success in planning? Specs? Team input? Communicating offsite conclusions? How do we make the schedule work? How do we manage Office 9/NT 5 dates? Dependencies? ericbe, gerardz, jacklit, hadip, cheechew, mikesch

For each group, they were asked to:

- Create a Success Statement... What would success look like if we improved in this area?
- Brainstorm Forces Helping or Hindering movement toward your preferred future
- Develop a Realistic Plan of Action (what, who, when)

### Group 1: Cross Platform

What are the problems? What do customers want?

Performance (on existing hardware), consistent user interface, and clear platform for deploying LOB applications.

What would success look like?

Sim ship (<= 4 weeks) IE + key components on key platforms with a clearly articulated x-plat common, competitive feature set/user interface where appropriate/admin and deployment. Critical requirements are:

- Simship key platforms
- Well-articulated LCD platform (our best effort...)
- Common UI/features
- Common Admin/Deployment
- Must drive Win32 value add. Need a compelling reason for customers to choose Win32, possibly use IIS/tools support to incent Win32 IE 5 features

Help/Hinder

Trading Windows specific innovations vs. x-platform. Need to make a decision on what to do here.

## Suggestions/Action Items

- Involve cross platform leads on all teams as peers, early and often
- Agree on a cross platform feature set
- Where code and features can be implemented cross platform, do so
- Need to be able to articulate Microsoft message to customers

## Questions

- "Why shouldn't you use Hydra as this solution?" Hydra is Win32 remoting to cross platform clients. No good answer, thought was that corporations wouldn't adopt.
- "Why would we do anything different than HTML 3.2 for down-level clients? In other words, how much of DHTML do we need to put x-platform?" Because we would like to drive the Internet client platform and standards, only way to do this is to deliver some set x-platform.
- "What about server based approaches for scaling HTML and projecting everywhere? Why not let the server degrade automatically to downlevel clients?"
- "Why is cross platform important to do at all? We have to have a Win16, UNIX ®, and Mac IE to deliver Win32 clients. Why isn't IE 4 good enough?" Most customers are using a browser, they have already chosen Netscape, we're trying to get them to switch.
- "Why is Win32 better than x-platform clients?" Today it's not, how do we make it better? Our team's challenge is to make Win32 better.
- "Are we doing cross platform as a non-blocker, or as a reason to switch?" Differentiator vs. checkbox
- "What is our dev strategy for cross platform?" Core code vs. native platform support.
- From a marketing perspective, sim ship is critical (bradc). If you miss the big bang, you've lost your opportunity. Better to sim ship with fewer features.

## Group 2: Browser Vision

### Success statement

1. TCO => easy to deploy and install. Roaming use.
  2. Fast, stable.
  3. Office users => speeds my document life-cycle. Helps me find, view, and follow up on my work
  4. Works just like my.... (NT 5, Office 9, mail client)
  5. I can create my LOB applications with IE/IIS faster, cheaper, and with broadest possible reach.
  6. Using my laptop is easy no matter where I am. Connect, snag, and run.
- Davidcol: What about roaming? Where does this come in? A: It is covered as part of TCO.

### Actions

- Official connections between Office and NT feature teams (jhenshaw)
- Value performance work, footprint, working set (rodc, joepe) Davidcol: Need a good way to get the team to run 16 MB machines. This is hard.
- Get more corporate customer exposure down to people on product team. Site visits (gaynaw)
- Dog food on customer centric machines (laurent)
- Create a plan to make sure same messages are getting sent (chrisjo, jhenshaw)
- Guard against component creep, apply against vision filter (jhenshaw, exec team)

### Questions/Discussion

- Self-healing is important (davidcol). How do we value this? Should be a part of this vision.
- Need to have great end user appeal (bradc). Needs to be so cool for end users that there is a reason to switch. Must make that more compelling. Lots of talk about how to achieve this and focus on it. Is this defocusing? (joeb)
- Need more drill down on what would be necessary to sell IE 5 to end users (jenk)



- One thing that would be good is to focus on finding what I want and getting back to it (brad). Making it easy to find information is a compelling feature.

### **Group 3: Shell Vision**

#### **Marks of success**

Increase NT 5 sales and build excitement in MS platforms by delivering a robust, fast, and simple shell.

Focus areas:

- Perf/Robustness
- ZAW/TCO
- Simplicity and consistency
- Others; Fast, Run great in 32 MB w/ NT 5 and Office 9, ZAW – support NT 4 features, Simpler than the 95 shell, Support O9 doc management

#### **Help**

- NT 5 team
- Clear charter to accomplish tasks
- Narrower focus than ie 4
- Good people
- Clear release vehicle

#### **Hinder**

- Integration with NT team. Many issues to work through.
- Time/schedule is tight.
- Tired group, just got off 4.01.
- Ski season/vacations.

#### **Action Items**

- Communicate a plan (jont/joeb) 12/15
- Buyoff from partners (jont/joeb) 12/8
- Triage feature list against vision (tbd) 12/1
- Memphis priorities/work (jont/rwaddell)

### **Group 4: Anti-Bloat**

Looked at three areas; Working set, download size/footprint, product team incentives

#### **Size/footprint**

How do we reduce download size? Success metric; 6 mb download

#### **Forces that help/hinder**

Strategic/marketing/political concerns. Hard to pull people out of the minimum install, makes it tough to manage.

#### **Work items**

- Minimum download of the browser that just contains min functionality (html 3.2)
- Dynamic page in of additional support
- Identify and eliminate OS dependencies
- Optimize LAN vs modem install (tomy)

## Discussion

- Bradc – 50% of users download stub but don't download other parts. Need to think about how to make this easier. One reason is it is too big, the other is that it is too confusing. Need to get call down data.
- Mwallent – how do we manage the diversity of platform for the content provider and ISV?
- Channing – is there an interesting way to make this common LCD platform? For WinCE/WebTV/x-platform. Might be interesting.

## Working set

Second area was working set, how do we cut by 50%?

## Success

- IE + outlook, IE + outlook + word work well in 16 mb win95, 32 mb winnt machines.

## Challenges

- Perf team looking at product on a macro level, need better focus on a micro level.
- Looking at ic in a vacuum, not with other apps. Customer cares about IE and other apps, not just IE.

## Action Items

- What is standard corp system, define this. One metric for the team. (yusufm)
- Test ie, ie + mail, ie + mail + office (perf test team)
- Tools for fit's to test working set themselves (joepe/rodc)

## Incentives for teams to focus on perf

Third area was incentives for team to focus on performance, how do we make this valued and prioritized in the organization?

## Success

- Entire team thinks about perf as primary goal

## Challenges

Our culture is to add cool shit to the product, not make it faster or smaller.

## Work items

- Check-in mail contains size deltas. EricBe – both for working set and code size.
- Feature acceptance criteria, no new dll's added for features.
- Size/perf focus for a month
- can't be at end of cycle, have to set clear goals, need to think through how to do this. Net net need to schedule significant time for performance.
- Competition between teams? Best working set reduction.
- Laurent - Need drivable numbers you can get to. How do we do this? Must have bought in goals on this.
- Chrisjo – Maybe you should think about how many dev's work on this stuff? Must track this.
- vigilant leads. Dev managers focus on this.

## Discussion

- scoth, need better metrics for working set. (joepe)
- Bradc, perception of perf is important.
- Kirksc, what is optimal system for you? Install choices.
- Scotth, registry bloat, how do we track this?

- Scott, itemizing per megabyte installation options so customers understand. Channing – including value of these.
- Davidcol – nobody used the word patch, how can we think about this better. Is someone going to look into this? We could really think about how to lower install size.

### **Group 5: Using Process to Ship On Time**

#### **Success**

- Ship on time. Hit delivery vehicles. Meet goals: features quality and completeness. Everybody believes schedule
- Communicate well. Everyone knows what we're building. Nobody is surprised when things are changed. Specs drive communication between groups.

Main action areas are specs, planning cycle, and communication.

#### **How specs help**

- Specs define the product
- Drive communication to all groups. Allow built in plan for test/perf/tco/security/x-plat/localization/accessibility/ue. Ericbe – don't put TBD for these areas, put hard questions or plan of action for these areas.
- Need clear definition of spec-complete and feature-complete, as well as exit criteria. Can't be perfect, but sure have room to improve. Hadip – spec complete = bitmap level, api level; feature complete = code checked in which matches that spec. Davidcol – don't make the spec the product, make sure you solve real problems.

#### **The ideal planning cycle**

- Brainstorm features and prioritize
- Work back from fixed ship dates
- Make clear, hard cuts, communicate these to the team
- Build a final plan/schedule
- Re-evaluate milestones, More often than betas

#### **Improving communication**

- Pm's own summary mail for all meetings. Dhach - Put all leads on aliases pm's use frequently.
- Routine war/leads meetings for each subteams leads (dev, test, pm, ue, web, etc), don't forget mtg summary.
- Team-wide meetings, piggy back off brown-bags. Goal is to keep team aware and bought in on project plan. What is right timeframe (davidcol)? Once a month or every 6 weeks.

#### **Using technology for communication**

- For specs -> notification updates
- For email -> newsgroups or faq's
- Warrenn – own setting up a newsgroup
- Dhach Office has top team mails – post to web site. Last person to the meeting writes up the notes from war meetings.
- Feature items map to test cases, have this be part of the spec that maps to test case. Dhach – could you have this integrated with dev schedule as well? Check in mail?

#### **Other processes that help**

- Buddy build/buddy test as part of check in. Laurent – who makes call on self host vs no self host? Chrisjo – we should just have bvt teams report and let people decide.

- Match owners (d/p/m/ue). Dhach – maybe have a big other alias to communicate to other people on the team.
- Bug bashes more often than ship milestones. Laurent – is this from a fixing point of view or finding point of view? Dhach - Weekly bug goals, is this a good idea? Hadip – we have done those but maybe we should do more often.
- Make raid more usable so we have test ownership across features – JenK suggestion. Dhach – carlt did this for office.
- Re-evaluate project plan more often than ship milestones.

## Davidcol Comments (Closing)

Good discussion today, good to think about these problems.

- Need to think harder about code reuse to reduce working set. How do we share code and not reinvent across teams.
- We need to do a much better job thinking about product holistically. Who owns end to end experience for customers? Ie 4, implementation was good at a feature area, transitions were rough. Ericbe – do we need some holistic, cross team thinking? Like Office shared teams? Dhach – Write a demo script before you write the code. Prototypes?
- We need to take an end to end view of the product, from install to the next upgrade. We need to take customers throughout the product cycle. Security updates, etc. This is a major customer satisfaction issue.