

Chicago

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Plaintiff's Exhibit

7406

Comes V. Microsoft

DEFENDANT'S
EXHIBIT

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Presentation Outline

- ◆ Chicago Overview - Bradsi
- ◆ Core Content, API's, Tools - Davidcol
- ◆ Connectivity - Johnlu
- ◆ Apps/Chicago Synergy, Issues - Davidcol

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Chicago Mission

◆ **For Customers:**

Make PC's the easiest to use system for everyone; a no-brainer upgrade from Win 3.1

◆ **For OEM's and IHV's:**

A no-compromise standard for PC's, leading to new growth

◆ **For ISV's:**

A mainstream platform which gives new opportunities for applications and application differentiation

◆ **For IS Managers:**

Lower the cost of support and training; the ideal net client

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Chicago

Key Improvements

- ◆ **Easy to Use**
 - **Plug and Play**
 - **New shell; easy configuration; long file names**
- ◆ **Integrated, complete 32-bit OS**
 - **Bootable**
 - **Win32c; OLE2**
 - **Protect mode I/O, networking, drivers**
 - **All capabilities available in Windows**
- ◆ **Great connectivity**
 - **Universal enterprise client; starter net**
 - **LAN and remote**
 - **Adminstratable and manageable**
 - **Workgroup features**

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Chicago Key Requirements

- ◆ **A worthy replacement to Win 3.1**
- ◆ **Compatible**
- ◆ **Robust**
- ◆ **Runs well on mainstream hardware**

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Easy to Use

Improved Shell

- ◆ **Unified system tool, cabinet.exe**
 - > **Merged Program Manager / File Manager**
 - > **Extensible to encapsulate control panel, printers, mail.**
- ◆ **Useful desktop with folders**
- ◆ **System "tool bar", aka the tray**
- ◆ **Drag/drop everywhere**
- ◆ **Shell maintained links**
- ◆ **Printer objects in the shell**
- ◆ **Better UI for MS-DOS app config**
- ◆ **OLE 2.0 enabled (scope tbd)**
- ◆ **File Viewers**

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Easy to Use

User Interface

- ◆ **3D look**
- ◆ **Titlebar changes**
- ◆ **Property sheets**
 - **doc file summary sheet supplied**
 - **extensible**
- ◆ **Popup menus**
 - **extensible**
- ◆ **New Transfer model (open issue)**
- ◆ **Scalable UI components**

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Easy to Use

Plug and play

- ◆ **Easy system configuration**
- ◆ **ISA plug and play hardware**
- ◆ **PCMCIA support, hot plugging**
- ◆ **Automatic configuration of new pnp devices**
- ◆ **Safe, easy system setup**
- ◆ **Extensible design accomodates new bus types and new resource types**

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Easy to Use

System Improvements

- ◆ **Long File Names**
- ◆ **Integrated os; one system to configure**
- ◆ **Windows tools to configure/manage the system**
- ◆ **Fragmented, shrinkable swapfiles**
- ◆ **Intelligent system defaults**
- ◆ **Reduction of INI file settings**

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Easy to Use

Applet Summary

- ◆ **Writepad: Write/notepad replacement. Built around the rich text control. OLE 2 enabled.**
- ◆ **Paintbrush updated with Apps Studio paint program. OLE 2 server.**
- ◆ **Personal Address book; MAPI PAB will be used as the cardfile replacement.**
- ◆ **Winpad PIM (Calendar, Todo, Rolodex)**
- ◆ **Telephony applet**
- ◆ **MPlayer 3.0**
- ◆ **Soundrec and Musicbox from Foghorn**
- ◆ **Microsoft Connection (RIP terminal)**
- ◆ **New Game**

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Modern Operating System

32-bit operating system

- ◆ **Win32c Windows apps**
 - > Preemptive scheduling, Threads
 - > Asynchronous input
 - > Separate address spaces
- ◆ **i/o system**
 - > File systems: Vfat; CDFS, Vredir
 - > File system drivers; NDIS; SCSI, IDE, etc
 - > Communications driver
 - > Installable protect mode file systems (IFS)
- ◆ **shell, kernel, printing subsystem, truetype rasterizer all 32-bits**

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Modern Operating System

Base os improvements

- ◆ **GDI/User heap limits significantly extended**
- ◆ **DIB engine (unidrv for displays)**
- ◆ **GDI/User object ownership**
- ◆ **Enhanced metafiles**
- ◆ **New print subsystem**
 - **supports many of NT print APIs**
 - **utilized enhanced metafile spooling**
- ◆ **Joint postscript driver with Adobe**
- ◆ **Loadable/unloadable and pagable VxDs**
- ◆ **More robust MS-DOS app support**

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Platform Improvement

New APIs

◆ **Kernel APIs**

- **Structured exception handling**
- **Memory mapped files**
- **Process control**
- **Thread level storage**
- **Debug APIs**
- **Console API subset**

◆ **Imaging**

- **Paths, beziers, enhanced metafiles**
- **Device Independent Color**
- **New printer/job control APIs from NT**

◆ **Plug and Play**

- **Dynamic change notification**
- **Power management**

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Platform Improvement

New APIs cont

- ◆ **Shell/UI**
 - > Shell extensibility APIs; right pane, property sheets, popups
 - > Registry APIs from NT
 - > User api to support the shell
 - > New controls: (see next slide)
- ◆ **Comm**
 - > TAPI / Modem drivers
 - > Comm APIs
- ◆ **International**
 - > NLS APIs (from OLE 2.0)
 - > Multilingual APIs
- ◆ **App integration**
 - > OLE 2.0

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Platform Improvement

New APIs cont

◆ **Network/Workgroup**

- Winnet api for browsing, connect, logon
- Security apis for password caching, authentication functions
- MAPI
- RPC
- mgmt apis
- windows sockets
- ifs interface
- File merge API
- Remote connection APIs

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Platform Improvement

New APIs cont

- ◆ **Pen**
 - Ink flow, ink manipulation, recognition, new ink edit control
- ◆ **Multimedia**
 - Audio compression, Vfw 1.1 runtime, VCR command set, Audio Mixing

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Platform Improvement

New Controls

- ◆ **Toolbar, Status bar**
- ◆ **Column heading**
- ◆ **Slider**
- ◆ **Scrollable button bar**
- ◆ **Progress indicator**
- ◆ **Tabs**
- ◆ **Listview**
- ◆ **Treewiew**
- ◆ **Property sheet**
- ◆ **Rich text control**
- ◆ **Enhanced common dialogs**

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Platform Improvement

Shell Extensibility

- ◆ **Cabinet extensibility**
 - Replace right pane based on folder class
- ◆ **Popups and menus**
 - add based on class
- ◆ **Property Sheets**
 - add based on class
- ◆ **Viewers**
 - mechanism tbd

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Platform Improvement

Multimedia

- ◆ **ACM 2.0**
 - IMA-ADPCM Codec
 - MS-ADPCM Codec
- ◆ **Vfw 1.1 runtime**
- ◆ **VCR command set**
- ◆ **Updated applets and control panel items**
 - CPLs: sound, MIDI, config
 - Applets: MPlayer 3.0, Soundrec and Musicbox from Foghorn
- ◆ **Audio Mixer APIs and Applet**
- ◆ **MS-DOS box sound contention management**

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Platform Improvement

APIs, APIs, APIs

- ◆ Win32 has ~ 2400 APIs
- ◆ Win32s has ~ 1,250 APIs
- ◆ Win32c
 - complete super set of Win32s
 - has ~ 400 APIs which came from Win32
 - has ~ 350 new APIs which are not in Win32
 - Total Win32c API count is ~ 2000

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Platform Improvement

◆ **What's Unique to Win32c?**
◆ **Approx. 350 APIs; NT/Cairo will pick up**

◆ **Areas covered:**

- **Device Independent Color**
- **Shell and shell support APIs, winnet**
- **Modem/TAPI**
- **Pen**
- **Multimedia**
- **Plug and play messages**

◆ **Implement in DLL where feasible**

- **Allows x86 apps to run DLL on NT**
- **Possible for Modem/TAPI**
- **Not possible for DIC or USER apis**

◆ **Warning: Chicago group isn't planning to test DLLs on NT**

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Platform Improvement

What's not in Win32c?

- ◆ API sets not in Win32c that are in Win32:
 - ▶ Security
 - ▶ Some Console API
 - ▶ Some registry API
 - ▶ Transforms (rotation/skewing)
 - ▶ Unicode
 - ▶ Server-side named pipes
 - ▶ Tape Backup
 - ▶ Event notification
 - ▶ Service control manager
 - ▶ Printer forms (still tbd)

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Development tools

Chicago Development Tools

- ◆ **SDK + DDK**
 - 16-bit and 32-bit tools
- ◆ **Focus on 32-bit tools**
 - Win32c apps
 - Protect mode drivers (VxDs)
 - Minidrivers (video, printer, modem, COM/LPT)

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Development tools

Chicago SDK Tools

- ◆ **Win16 tools essentially unchanged from 3.1**
- ◆ **VCE group working closely w/ Chicago team**
 - > **In M4: Compiler, Linker, Debugger if ready**
 - > **M5, M6: Schedule for deliverables tbd**
- ◆ **VCE and Chicago team joined to deliver great PDKs**

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Development tools

Chicago DDK Tools

- ◆ **Real mode/16-bit drivers unchanged**
- ◆ **32-bit drivers are protect mode, MASM 6.x**
- ◆ **New driver classes:**
 - **Miniports + other protmode VxD drivers (PnP-enabled)**
 - **Enhancements to Unidrv**
 - **New DIBEng-based video minidrivers**
 - **Modem minidrivers**
 - **Protect mode network drivers**
- ◆ **32-bit drivers require special linker**
 - **We will give our changes to DT**
- ◆ **NuMega has SoftIce for Chicago**

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Chicago Progress

Schedule

- ◆ Self-host Sept 92 (done)
- ◆ Early Dev Release March 93 (done)
- ◆ PDK release (M4) July 93
- ◆ Beta 1 (M5) Oct 93
- ◆ Beta 2 (M6) Feb 94
- ◆ RTM April 94
- ◆ "Mid 94" to the outside world

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Chicago Progress

What works today

- ◆ **Easy to use**
 - Self hosting on new shell and UI (16-bit)
 - MS-DOS app config API
 - Links, tho not complete
 - Printers, Control panel integrated with cabinet
- ◆ **Modern OS**
 - 32-bit i/o system
 - 32-bit file systems: Vfat, CDFS, Vredir
 - 32-bit comm support
 - Win32s API support, plus threads
 - New print system (16-bit)
 - DIB engine display drivers
- ◆ **Platform improvements**
 - new controls (16-bit)
 - enhanced metafiles

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Chicago Progress

Milestone 4 Content

◆ What works today plus:

- > Long File Names
- > ISA plug and play support
- > preemption
- > Async Input
- > DIC plumbing
- > Snowball net features
- > Multimedia features
- > new setup

◆ Win32c development kit

- > Console
 - > Debug APIs
- ### **◆ Device driver kit**

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Chicago Progress

Milestone 5 Content

- ◆ **Performance / Size work**
- ◆ **32-bit-izing the shell, the print system, etc.**
- ◆ **OLE enabling**
- ◆ **Capone, MAPI**
- ◆ **Plug and play**
- ◆ **more....**

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Connectivity Objectives

- ◆ **Enterprise Client, and Starter Net**
- ◆ **Mobile Connectivity to NT, Netware, Chicago**
- ◆ **Workgroup & Office Features**
- ◆ **Support Key Base Chicago Features**

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Enterprise Client & Starter Net

Netware Compatibility

- ◆ **No need for Novell Netware client or Personal Netware with Chicago**
- ◆ **Complete protmode implementation of Netware-compatible client code**
 - ◆ **IPX**
 - ◆ **NCP Redirector**
 - ◆ **NCP Server**
 - ◆ **Print server, backup, diagnostics**
- ◆ **Well integrated with Chicago -- Explorer, IFS, Driver Models, etc.**
- ◆ **More robust than Novell implementation**

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Enterprise Client & Starter Net

Manageability

- ◆ **Administrative control over peer services**
- ◆ **Remote Administration of server**
- ◆ **Remote Console**
- ◆ **Remote Backup**
- ◆ **Security passthru to NT or Netware (or other...)**
- ◆ **Evaluating config mgmt ala Winlogin, Hermes**

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Promiscuous Driver Support

- ◆ **New Winnet Driver interface -- multiple nets supported**
- ◆ **SMB and NCP redirs and servers. Published IFS interface**
- ◆ **RPC over NetBIOS, Windows Sockets**
- ◆ **NetBIOS and Windows Sockets Transport Interfaces**
- ◆ **IPX, NetBEUI, TCP stacks in the box (st disk space). DLC separately available. Compatible with any NetBIOS stack**
- ◆ **NDIS 3, NDIS 2, ODI drivers**
- ◆ **Evaluating new classes of media -- wireless (WAN and LAN), isochronous (isoENET, ATM)**

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Mobile Connectivity

Remote Access

- ◆ Dialin access to NT RAS, LM RAS, Chicago servers
- ◆ Protocol independent -- NetBEUI, IPX
- ◆ TAPI based
- ◆ Best of breed ease of use (Apple ARA)
- ◆ Deferred email, printing
- ◆ Shadowed file i/o

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Workgroup & Office

Messaging

- ◆ **Messaging UI integrated with shell (Capone)**
- ◆ **Address Book**
- ◆ **MAPI subsystem and drivers**

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Workgroup & Office

AtWork integration

- ◆ **Bundled FAX support**
- ◆ **TAPI, Address Book Dialing**
- ◆ **WinPad integration**

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Base Chicago Features

PNP

- ◆ **Card drivers PNP aware**
- ◆ **Transports, Redirs, Servers Pageable**
- ◆ **Point and Shoot Printing**
- ◆ **Applications can register to be notified of net events, e.g. drives being connected or disconnected, logon/logoff, dock/undock, etc.**

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Base Chicago Features

Other Base Features

- ◆ LFNs -- to/from Chicago, NT, Netware
- ◆ All components protmode
- ◆ All new services exposed via 32-bit interfaces

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Backup

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Security Details

- ◆ Password cache and central logon promoted to system-wide services (formerly in WFW winnet driver)
- ◆ Access control based on username and password will be provided in addition to share-passwords
- ◆ User accounts can be defined and authenticated on a Chicago machine or on a NetWare, NT or other server
- ◆ System will include APIs for apps to provide access control to application objects with arbitrary permission types
- ◆ Dialog-level interface for access control will be provided, with lower-level APIs only as they prove necessary.

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Apps / Chicago Synergy Ideas to get us started

- ◆ **What's a good Chicago app**
- ◆ **So what's the problem?**
- ◆ **Ideas to get us thinking and moving forward**

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What's a Good Chicago App according to today's plan?

- ◆ **Plug and play compatible**
 - Supports dynamic environment changes. Display, network, hardware, etc.
 - Easy to install and has uninstall capabilities
 - Makes setting app preferences a no-brainer
- ◆ **Supports new UI**
 - Matches 3d visuals including 3d shading colors
 - Uses common dialogs and other system controls where appropriate
 - Supplies small and large icons
 - Utilizes context menus and property sheets internally
 - Does drag/drop everywhere, including to/from the shell via OLE 2.0, to printers, etc.

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What's a good Chicago app

Good Chicago app cont.

- ◆ **Exploits shell features**
 - Extends the systems' property sheets and context menus for classes that it owns
 - Supplies a great file viewer
 - Uses the recycle bin for deletes and cuts
 - Supports shell links
 - Replaces right pane of cabinet if appropriate. IE mail store or a document library or a database.
- ◆ **Supports long file names and UNC names**
- ◆ **It's a Win32c app**
 - Preemptively scheduled and async input make it a better app in the system.
 - Utilizes enhanced metafiles

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What's a good Chicago app

Good Chicago app cont.

- ◆ **OLE 2.0 enabled**
 - supports drag/drop with the shell
 - registers any special verbs like "play" if need be
 - does all other cool OLE interoperability things
- ◆ **Network app, has workgroup features**
 - Works great setting up and running off the net
 - Follows file sharing rules
 - Uses MAPI to be mail and fax enabled
 - Uses MAPI PAB to get at name and address info
 - Uses RPC for client/server interactions
- ◆ **Is a great mobile app**
 - Slow link awareness
 - Dock/Undock support (plug and play)
 - Power management smart

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What's a good Chicago app

Good Chicago app cont.

- ◆ **Supports other platform improvements**
 - **Comm apps use TAPI**
 - **International support. Uses NLS api to get system supplied locale information, sort tables, etc. Utilizes multilingual API to get/set keyboard layout and fonts for i/o in multiple languages.**
 - **leverages printing improvements**
- ◆ **It's fast and robust**
 - **app is tuned for size and performance**
 - **efficient when multiple instances are used**
 - **uses structured exception handling**
 - **tested under debug Windows and on NT**

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So what's the problem?

- ◆ **OLE and Chicago are not leveraging each other**
- ◆ **Shell/app integration isn't as good as it could be**
- ◆ **Agreement on UI improvements are slow**
- ◆ **Workgroup/apps integration is weak**
- ◆ **Programmability synergy is weak**
- ◆ **Groups are not moving forward together and sharing technology as well as they should.**
- ◆ **Will the apps group do everything listed?**
- ◆ **Is the list complete? Is everything there that the apps group wants?**
- ◆ **Lack of feedback that leverages the apps groups' experience to improve the system**

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Shell and User Interface Synergy

Joint OLE 2.0 / Chicago goals

- ◆ **Chicago should be the preferred platform for OLE apps. (IE An OLE app needs to be a lot better on Chicago than on Win 3.1)**
 - > tune OLE 2.0 size, perf, features for Chicago
 - > add value to OLE apps via the shell
- ◆ **The best Chicago apps are OLE enabled.**
 - > apps take advantage of the above to deliver unique and useful function
 - > better interaction with each other and the shell

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Shell and User Interface Synergy: OLE 2.0

Chicago's planned usage

- ◆ **Use OLE code for:**
 - ▲ shell <-> app drag/drop; scraps, files
 - ▲ GetclassID for opening documents, not for enumerate due to performance problems.
 - ▲ doc file summary page in file property sheet
 - ▲ iDispatch support in the shell for some limited set of commands tbd.
 - ▲ applets
- ◆ **Don't use OLE code for:**
 - ▲ right pane replacement in cabinet.
 - ▲ context menus extensions
 - ▲ property sheets extensions
 - ▲ Links

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Shell and User Interface Synergy: OLE 2.0

Ideas for Making Chicago a better platform for OLE apps

- ◆ **Size and speed work in OLE**
- ◆ **OLE client enabling of folders.**
- ◆ **Make OLE links and Chicago links the "same" for users.**
- ◆ **Find files based on OLE properties**
- ◆ **Use OLE as the shell extensibility mechanism**
- ◆ **include useful OLE servers.**
- ◆ **Universal MDI container app for projects (would be a new OLE feature)**
- ◆ **more....**

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Shell and User Interface Synergy: OLE 2.0

OLE size and speed work

- ◆ doc file integration into the file system for size and speed improvements.
- ◆ Drag/Drop code
- ◆ GetClassFile
- ◆ Getting doc file summary page, includes thumbnail
- ◆ doc files (work in progress)
- ◆ in situ editing
- ◆ iDispatch

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Shell integration ideas for improved multi-app scenarios

- ◆ system wide MRU document list
- ◆ system wide window list (document centric)
- ◆ utilize "the tray" for app commands
- ◆ Windows button in every Chicago app which calls up common, useful function supplied by the system. (alternative to the tray)
- ◆ we need to look at what MS Office is doing and leverage

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Shell and User Interface Synergy

Getting UI agreement

- ◆ **MDI/SDI, Workspaces/Workbooks, projects, etc.**
- ◆ **Transfer model**
- ◆ **UI details: property sheets, transfer model, popups, 3d look, toolbar design, etc. Progress here is pretty good actually.**
- ◆ **Common dialogs, Toolbar control and the rest of the system controls need to made good enough for major apps, which include extensibility**

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Programmability Synergy

Programmability

◆ Plan of record

- the shell will expose some commands via iDispatch, but exact list and format completely tbd
- vbasic applet is plan of record, but no decision on if it's VB3 or VB4 based.

◆ How to improve

- exposed commands should be consistent with Excel and Word
- should we put object basic in the system?
- some language is needed for logon scripts
- where do component forms and VBA/VB 4 fit in?
- macro recorder support?

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Workgroup and Networking Synergy

Workgroup Scenarios

- ◆ **Current Plan**
 - Mail and MAPI in Chicago
 - Library system in Office
- ◆ **How to Improve**
 - Library storage in the system ?
 - Clipboard/Templates. There ought to be a very simple way of getting to shared libraries of clipart, templates, etc
 - Make links work on the net. Creating a link locally and moving it around the net does not work currently
 - Routing, Delegation support
 - Integration of Schedule+/Calendar -- due dates, alerting, etc
 - Alerts. Notify users of new versions available, requests to close files, etc.
 - Standard shared ISAM implementation. (or local ISAM implementation for that matter)

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Workgroup and Networking Synergy

Users/Security

◆ Current Plan

- MAPI address book separate from LAN security user databases separate from app security user databases
- Apps considering storage of user-prefs, but no available mechanism
- No standard security technology

◆ How to Improve

- Single notion of a "User". All our apps and system components should use one API for user-based data
- Storage of User prefs should be done, using the above API/DB
- Provide User-based operations in Apps – Send, Dial, Chat, Alert, Share, etc.
- Authentication of users using one single database
- Signatures, ACLs, or other security mechanisms on individual files

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Other areas to improve synergy

- ◆ **Spell checker; OLE API and dictionary**
- ◆ **File sync merge handlers and apps doc management**
- ◆ **Chicago File viewers / app filters**
- ◆ **Text Editing: adopt the new selection model that word has, assuming it's cool**
- ◆ **Install/Uninstall: can Chicago help with uninstalling the shared components?**
- ◆ **Size. Getting Chicago and more than one app to work on a 4 meg system**
- ◆ **Default 256 color pallet (done)**

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Still more...

- **Should we include ODBC in the box?**
- **Multimedia. is this being leveraged?**
- **Licensing API?**

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