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PRESENTATION: API Strategy - Final

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Microsoft API Strategy

September 19

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Situation

- Windows application development is the standard for ISV, SP, and corporate developers
  - Key Win32 APIs are wrapped by VBRUN, MFC, Delphi,...
- New, non-MS platform is emerging
  - Driven by Internet distribution
  - Java based
  - Cross-platform
  - Network centric
  - Windows agnostic

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Implication

- Computers are now sufficiently powerful for Java middleware to succeed for form and content-centric applications
  - Driven by Internet distribution.
- MS has lost significant control over innovation for the new Internet platform
  - Sun's Java* classes are well established

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Microsoft Goals

- Provide compelling reasons for Windows development
- Establish leadership in the new Internet platform, distributed computing environment and programming model
  - Match the competition with Java and cross-platform (OS) support
  - Support rapid, maintainable development of distributed applications
    - language neutral, seamless in Java

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Microsoft Goals

- Re-establish the foundation for innovation
  - Regain control of the platform definition and innovation
  - End the least common denominator phenomenon
  - Leverage our distributed services, interoperate with others
- Win by: Creating a compelling developer message
  - HTML leadership
  - Being the best offering on Windows; making Windows the best for the Internet
  - Support for all mainstream languages (not just Java)
  - Great Microsoft tools, great support from systems for Microsoft Tools

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Objectives

❶ Developer adoption of Windows-specific interfaces

- Optimize for Windows

❷ Developer adoption of MS-specific cross-platform libraries

- Stick with Microsoft, stay in the program

❸ Developer adoption of our tools and frameworks

- Allows us to steer the community on the best path

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Application Categories

- Conventional "thick" Windows client apps
  - Office
  - Not at short-term risk
- **Client/Server forms apps**
  - **Corporate, vertical**
  - **Moving to Web-based technology "Weblications"**
- **Web-based content apps, multimedia**
  - **CD-ROM today, "Weblication" tomorrow**
  - **Encarta, Amazon.com**
- Collaborative apps
  - Realtime: Netmeeting, chat
  - Workflow: Notes, Exchange
  - Moving to Web-based technology over next 2 years
- Games
  - Quake, Monster Truck Madness
  - Serious ones not at risk right now

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Category Messages

- **Client/Server forms apps**
  - Transition simple apps to Web technology
  - More complex apps will require better tools
  - Based on: Trident, Denali/Viper, High level language frameworks
- **Web-based content apps, multimedia**
  - Leverage HTML features of Trident
  - Leverage Windows-specific class libraries based on COM Windows, including Trident
  - For Cross-platform support, use our tools and class libraries subset

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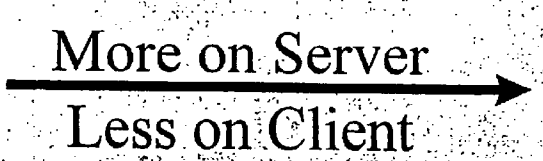
Strategy for Content & Client/Server Developers



Leverage IE share to focus on MS extended HTML

Client development

- Netscape ONE, Java.* only
- MS Class libraries

Why?

- Great support for IE on Win32
  - Great services, tools, size, speed
  - Great server support
- Reasonable cross-platform support
  - IE, Mac, Unix
- Reasonable Navigator support

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Where we are today

- MS has taken the lead in HTML
  - New Navigator 4 object model extensions indicate their HTML support is read-only
  - Trident can incorporate Netscape extensions, go beyond
- Java environment deeply entrenched
  - Sun's Java.* classes, bytecodes well established
  - Netscape ONE could fragment the market
- Windows API inaccessible from Java
  - MS has extended Java in IE 3 with COM, AWT extensions, DirectX, but we need to do more

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Where we are today

- ActiveX controls are platform and browser dependent
  - ActiveX controls on Windows are tied to User
    - All controls call Win32 APIs
  - Support in Navigator is weak
  - Today's Mac and Windows embedding/control interfaces are not compatible
  - New ActiveX controls for Mac use Mac-specific interfaces

Implications:

- Cross-platform ActiveX Control support requires a higher-level abstraction and new code
- Support in Navigator for ActiveX controls must be fixed

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Approach

- Tools drive business developer adoption
  - Compelling tools drive adoption of MS strategy
  - Tools determine the libraries, frameworks used in solutions
  - Tools are the hook to developer information programs
- Define services which are compelling to developers and are only available on Windows
  - "Your competitors will take advantage of this stuff…"
- Where developers demand cross-platform capabilities, supply a superior solution so that they are using Microsoft interfaces and tools
  - Above all, keep them in the program, keep them using our tools

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Competition - Netscape ONE

- HTML
- Javascript
- Plug-ins
- Java Applets
- Live Connect (including IIOP)
- Internet Foundation Classes (IFC)
- Java Runtime Environment
- Browser protocols: (HTTP, LDAP, IIOP, SMTP, . . .)

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Competition - Netscape ONE

- Liveconnect is object model
  - Netscape equivalent to JavaBeans
  - Supports IIOP for distributed computing
- Internet Foundation Classes
  - UI (Basic controls, multifont text, windowing animaption, drag/drop, signle threaded concurrency, object persistance, localization)
  - Messaging: SMTP, POP3, IMAP, NNTP
  - Security: SSL, X.509v3 certs, signatures, extensibility
  - Distributed Services: IIOP exposure

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Competition - Javasoft

- Java.* is Java's "stdio" class libs for the '90s: AWT, Net, Lang, IO, JDBC
  - AWT
    - Simple windows, frames, widgets
    - Simple events
    - Layouts
  - Net - classes for networking
    - TCP/IP sockets, URLs (http, ftp, gopher, wais, …)
  - IO - file i/o
    - sequential and random access
- Borland's Latte and Symmantec's Café are high quality RAD tools targeted at Java.*

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Competition - Javasoft New Classes

- Java Beans Embedding/Control support
  - Ties Beans to AWT
  - Clipboard, Keyboard accelerators, Drag/drop,"Uniform Data Transfer"
- Media - Framework:
  - 2D: (Adobe), 3D: (Intel, SGI)
  - Animation, Audio, Collaboration, Video, Telephony
- Security -Authentication, code signing, encryption
- Commerce (Wallet)
- Network Management: (SunSoft)
- Late: Q2 '97?

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Competition - Java Beans

- Component model for Java Platform
  - Higher level than Java classes
  - Leverages java.* and VM facilities (likely to be folded back into java.*)
  - major overlap with OLE (interop "for free")
  - Additional tool-centric featureset
- Endorsed by system and tool vendors - Borland, IBM, Netscape, Sun
  - Sun designed infrastructure (serialization, etc.)
  - Component features designed and engineered by Borland
- Current plans are dependent on AWT
  - Implication: Container and all services must be AWT based

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Java Beans Facilities

- Interface publication and discovery: "Reflection"
- Event handling
- Persistence
- RAD infrastructure: Inspectors and editors

- Layout: Embedding (still TBD)
- Distributed location and activation: RMI and Corba

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Competitive Comparison

Category	ActiveX/Com	JavaBeans	Netscape One
Interface publishing & discovery	typelibs, QueryInterface	reflection/ introspection apis	JavaRegistrable Interface (JRI)
Events, inter-component connections	ActiveX Events model	Beans events model	LiveConnect
Persistence	IPersist*	Beans serialization specification	Persistence framework in IIIOP
Layout	ActiveX control/DocObject layout specs	Beans (AWT based) embedded layout spec	Windowing framework in IIIOP, Plug-in layout
Security	SSL/PCT/NTLM SSP	Unclear	SSL
Distributed app services	DCOM, RPC	RMI, CORBA	IIOP (part of CORBA)
Database connectivity	ADO, OLE-DB	JDBC	JDBC

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DCOM/IIOP: Competition

- **Sun**: Java RMI (Remote Method Invocation)
  - Highly criticized as awkward and non-intuitive
  - In beta with free DOOR ORB (non-IIOP)
  - Integration with Sun's JOE/NEO product line key
  - Expect IIOP and built into Java 1.1 (Fall release)
- **Netscape**: bundling Visigenic's VisiBroker
  - Technology acquired through merger with PostModern
  - More transparent, simpler than RMI, very similar to Java/(D)COM integration
- OMG: A spec with vendor implementations

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DCOM/IIOP: Technical Overview

- DCOM
  - *Security*: pluggable RPC security via SSPI. NT security primarily. no SSL/SET SSPI plan-of-record.
  - *Transports*: most network transports, including TCP. final HTTP-tunneling plan incomplete.
  - *Performance*: ~15% over raw TCP sockets. Excellent scalability.
  - *Tools*: well integrated with most languages. supports arbitrarily complex types. works with GUI applications.
- IIOP
  - *Security*: none OMG-defined. expect NS to use SSL & SET, certificates for authorization (access-checking)
  - *Transports*: TCP-only. no HTTP-tunneling.
  - *Performance*: varies wildly. NS and Sun under investigation.
  - *Tools*: weak for C/C++, type-limitations are constraining. works poorly with GUI. Java is unfortunately a great fit. Sun's JavaIDL and NS's VisiBroker SDK's are at least as good as our Java/COM integration tools (JavaTLB).

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Competitive Summary

- Sunsoft's core classes have developer mindshare
  - Will be significantly enhanced in V2
- Netscape's Internet Foundation Classes will be driven/limited by future success of Navigator
  - Cross-browser claim yet to be tested
  - Primarily consumer driven, not likely to have major impact in corporations
- MS ability to lead Java developers is largely driven/limited by IE share
- DCOM/IIOP will be driven by time to market

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Recommendations

- Follow similar strategy to Browser: Embrace and Extend - particularly with Java and Java.*
- Focus on synergy between IE and Tools
  - HTML + Script + Active controls as target platform
  - Host IE features as a plugin in Navigator
- Make integration between Java and ActiveX as seamless as possible
- Adopt JavaBeans as Java language integration for OLE/COM

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Recommendations (cont'd)

- Build out existing language-specific frameworks (VBRUN, MFC, Java.*)
  - RAD depends on language / framework integration
  - Make language-specific part as small as possible
    - Make most services language independent
  - Fix existing problems: Versioning, typelibs, …
  - Create system COM interfaces that are optimized for support of frameworks

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Recommendations (cont'd)

- Windows as language-independent COM
  - All new system services as language-independent, well-structured COM objects and interfaces
  - Restructure the most leveraged Windows services as well-structured COM objects
    - Focus is on simplifying the Weblication developers job on Windows
    - Platforms and tools work together on this - must be great for language framework integration
    - Make a subset of these services available cross-platform
  - "Mechanically" thunk Windows APIs to COM to allow Java programmers access to Windows APIs

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Recommendations (Con't)

- Make DCOM Adoption a High Priority
  - Establish Openness with OpenGroup
  - Ship DCOM in IE4
  - Tools adoption in VB, VC, VJ
  - Add COM/DCOM support to Netscape Navigator
  - Provide a MS COM/CORBA? Or leave to 3rd parties?

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Alternatives & Scenarios

- Alternative Strategy: Build MS Java classes to compete with Java.*
  - Java.* has momentum, we'll never catch up
  - Java.* is the "stdio" of Java, we'll look like we don't get it
- Best Case Scenario: Fragmented Class definitions
  - Netscape/Sun fragment Java Classes, object model
  - Even a fragmented Java will be successful, but will target Sun-defined least common denominator initially
  - Leaves MS time, opportunity to build Windows-based momentum around our definitions, tools
- Worst Case Scenario: Sun/Netscape/Borland team up on Java classes and Java tools

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Top Priorities for COM Windows

- Our value add is making Networked Windows Weblications easy
  - Java.net only defines URL, Sockets interfaces
  - We can (must) take leadership on advanced services
  - Sunsoft is focused on "wrapping" existing definitions
- All work must be tuned for language integration, especially Java
- Build in our fundamental distribution technologies
  - Load balancing, name transparency (DCOM vs. RMI)
  - Transactions

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Top Priorities for COM Windows

- Storage/Directory
  - Folders/Namespace/DFS
  - Directory service management and access - OLE DS
  - Property access
- Database query and access (vs. JDBC)
  - ADO, OLE DB
- Security (vs. JECF)
  - Authentication, Authorization, Wallet, Encryption, Signing, Safety
- Simple Messaging

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Single Windows Model

- We must have a single *Windows* story for client and server components/extensions
  - Current market situation mandates Netscape support
  - Apache should be guided to use our model on NT
  - More than APIs, it's also also the complete model and environment
- Requires:
  - Plug-in for Navigator to run MS HTML and COM services - utilizes DCOM
  - Denali and Viper extensions work under NT Netscape Server (NSAPI), NT Apache server - utilizes DCOM
  - Common controls as Java classes for cross-browser/platform
  - Strategy for making UNIX Apache, Netscape migration easy

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Windows Advantages

- *Single platform target* in a time of fragmentation (client and server)
  - need to regain this
- Client market share
  - ISVs need to, will optimize for Windows
  - New things appear on windows first
- Windows has the complete version of…
  - Full IE
  - Full Trident
  - Full set of Windows Interfaces (available to Java)
  - Full set of client-side database APIs
- Microsoft is focused on Windows
  - Performance will be best on windows
  - New things appear on windows first
- Multimedia/graphics is best on Windows
  - Great DirectX
  - Fastest, best support of new devices
- Focus of Distributed services innovation on both client and server
- Active Server platform
  - by far the coolest server programming environment

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Windows Innovation

- In the past, represented as ongoing flood of new APIs
  - This is continuing
  - It is becoming a liability -- too much complexity
- Focus MUST be on simplicity as we move to COM interfaces
  - Easy to figure out
  - Easy to access new services
  - Easy to exploit the network from Windows
  - Language / Framework integration
- Security blanket
  - We're here for the long run
  - We protect your investments

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Cross-platform Support

- Goal: Create a safe Active Control binary which can run in on Win32, Mac, Unix
- Requires:
  - Container platform: Internet Explorer, Navigator
  - Middleware API: Java.* + X-Platform COM Subset
    - Trident subset (No DirectX)
    - Drawing, controls
    - Database subset (No local storage)
    - Optionally Safe: Signature tells IE to sandbox control
  - VM
    - Single Microsoft VM
      - Extend Windows Java VM to support VB
        - Use Collusa technology to support C++, SQL, ...

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Cross-platform Support

- Approach:
  - Design infrastructure for cross-platform Java and VB
  - Once design complete, decide whether it is worth supporting cross-platform VB or just using Java
  - Focus C++ products on high-performance Windows development

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Language / Framework Integration

- Languages already promote a programming model
- Tool presents a user model for the developer
- Approach needs to be tool centric
  - Tools provide direction to developer - this needs to be consistent with our systems strategy
- Developers want straightforward access to system services
- By providing quality system services which meet developer needs, the language specific framework can be made thinner

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Tools Evolution

- Finish Tools V5 releases
- Target IE 5 (or 6) at application development
- Focus on combining Internet Studio, Java, VB into RAD Internet development environment
  - HTML + Script + Active controls as target platform
    - Trident forms
    - Make IE the IDE
    - Client-side Active controls, server-side Denali, Viper objects
      - Written in Java and VB
    - Active scripting on Client and Server
      - Javascript and VB Script
- Enhance VC++ for current customers

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Java Approach

- Use our Windows VM to own Java.* and Beans
- Build on Java.*, Beans as the Java framework
  - Extend these to run best on Windows
- Expose Win32 functionality in Java.*/Beans
  - Provide MS APIs where possible
  - Change Java.*/Beans to support MS objectives - ActiveX
  - Use Sun's approach where necessary
- Provide MS alternatives for other Sun services
  - Net, RMI, Media, commerce, security

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MFC Evolution

- Minimal evolution of MFC 4.2
  - New system features as static link libraries
    - New common controls - Datetime picker, Coolbar, ...
- Future MFC
  - Implement new functionality as COM classes
    - Address Versioning
  - Investigate restructuring of MFC to reduce fragility
    - Stay compatible with MFC 4.2!

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ATL

- Make ATL work very well in the MFC environment
  - Common marketing message
- ATL 2.0 for hard-core ActiveX controls creation
  - Keep ATL small and fast
  - Remain focused on components, not apps

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VBRUN Evolution

- Leverage common infrastructure with Java
- Slimmed down & Versionable
  - Strip out Ruby
    - Package as standalone Active Designer that we deprecate over time
  - Strip out ExCode engine
    - VB should target the Windows VM
  - Move some VB objects into a core system runtime where they can also be shared by other tools.
    - E.g., Printer, Clipboard, Screen
    - We have already done this for Font and Picture

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TypeLib Requirements

- Extremely compact, great performance
- Sufficient for all core languages
  - Type support for VB, Java, VB Script, JavaScript, SQL, and C/C++ including debugging
- Enable multiple providers
  - Dynamic creation
  - Language independent interfaces
- Easily queryable and updatable
  - Object description database
  - Generic operators for data manipulation
- Extensible

Typelibs currently achieve none of these!

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Typelib Recommendation

- Build a new core type system
  - Leverage many concepts from Java Class File
  - Support Typelib requirements
- Provide "Beans" view for Java
  - Concepts could be leveraged for other languages
- Provide "Typelib" view for downlevel OLE

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Trident Forms

- Trident needs to become a core part of the programming model
  - HTML part of HTML+Scripting+Active Controls
  - Time to market is critical
  - Programming Models:
    - HTML Active Document
      - VB/Java Code attached to to Trident object model
    - HTML Active Controls
      - Form becomes a control runtime
    - HTML Active Dialogs
      - Forms used as dialog manager
      - Trident and AWT objects are independent

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Drawing Approach

- Build language-independent COM interfaces to GDI and DirectX
  - Thin layer on top of GDI
  - Make subset cross-platform
  - Focus on ISV requirements
  - Fit these into AWT framework
- Why will ISVs use this?
  - Brings richer GDI/DirectX specifics to Java
  - Provides these services to other VB, C++,..
- We've already extended "Graphics" in AWT with "GraphicsX COM interfaces"
  - Beziers, font extensions, Intl.,etc.

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Database

- ADO is language independent API
  - Small OLE DB mapping under development
- Client side support to ODBC and OLE DB data
- 3 Tier through Active Data
- JDBC
  - Widely adopted, equivalent to RDO 1
    - Forward-only cursor, no bookmarks, no batch update, no snapshot semantics, no local indexing
  - Extend JDBC with ADO semantics

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Developer Message

- HTML + Script + Active controls as target platform
  - Our RAD tools target this platform
- Target Language-dependent frameworks plus MS COM Windows Classes to take full advantage of Windows
  - Cross-platform ISVs target subset for LCD
  - MS will make your components work under Netscape client and server; Apache NT Server
- Use VIPER/DCOM for distributed apps under the Active Server environment
- Use C++ for platform-dependent, high performance components

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How does Microsoft Win?

- Redefine the platform
  - HTML + Script + Active controls
- Embrace, extend, lead where momentum is with Sunsoft
- Do a better job than Net ONE for developers
- Developers use our tools
  - Approach, mindshare
- Requires leadership in Browser marketshare
  - Developers target MS API extensions
    - Focus on Windows

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Summary of Necessary MS Actions

- Focus future IE and tools on "Weblications"
  - Define the new platform
  - Build RAD tools
- Java and Java.*
  - Extend Java.* classes with MS features, services
  - Provide MS alternatives for other Sun services
  - Adopt JavaBeans as Java language integration for OLE/COM
  - Single Microsoft VM targeted by Java and VB
    - Use Collusa technology to support C++, SQL, ...

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Summary of Necessary MS Actions

- DBSD
  - Expose Win32 functionality in Java.*/Beans
  - Focus DBSD API efforts on language-independent COM objects
    - Top priority is distbributed services
    - Build language-independent COM interfaces to GDI and DirectX
    - Restructure the most leveraged Windows services as well-structured COM objects
  - Beat IIOP with DCOM

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Summary of Necessary MS Actions

- Cross Platform
  - Work with DonBrad to provide subset cross-platform
  - Get serious about ActiveX support under Navigator
  - Get IIS extensions to work under NT Netscape Server
- Communicate the message:
  - Focus each team on the new platform: HTML + Scripting + Active controls + Windows

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