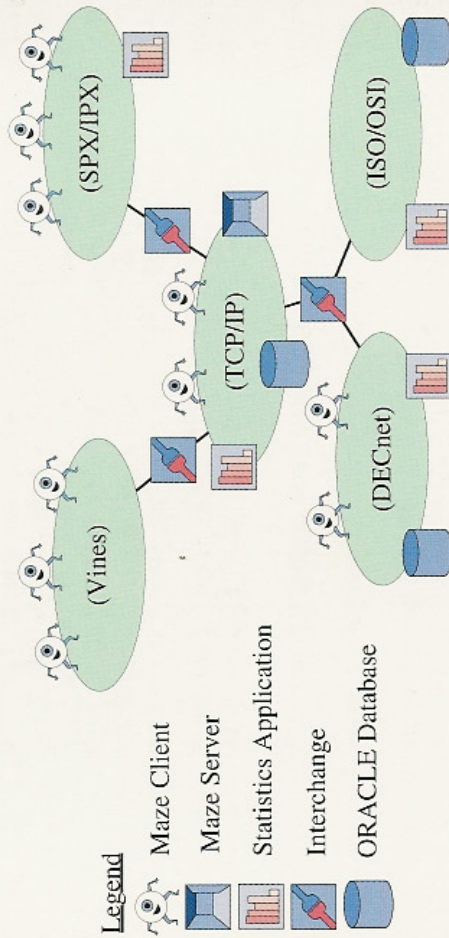


Maze at INTEROP™



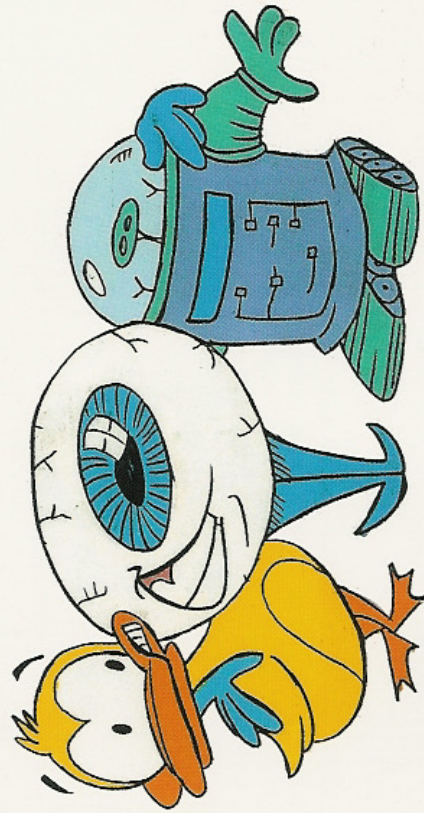
Maze game clients connect, through an Interchange where necessary, to the Maze server to play the game. Game details are logged to one of three Oracle databases and distributed to the other two. Maze statistics are queried from any of the three databases and displayed in the Maze stats application.

Play the game and come to Maze Headquarters for your Maze collectable.
Game stations are in many booths on the show floor. High scores each hour and each day win fabulous prizes.

ORACLE®



Maze

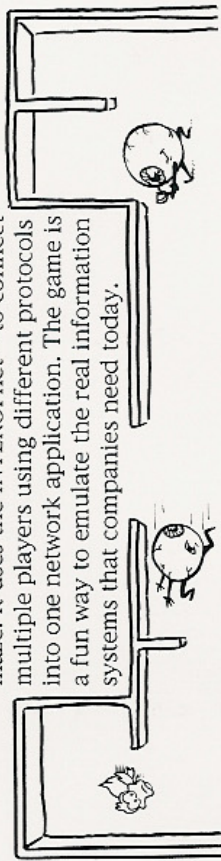


A Cooperative Networking Demonstration at INTEROP™

ORACLE

What is Maze?

Maze is a networked game that stages multiple players as opponents in a 3-D maze. It uses the INTEROPnet™ to connect multiple players using different protocols into one network application. The game is a fun way to emulate the real information systems that companies need today.



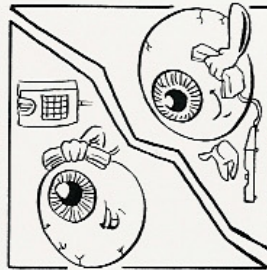
What does Maze mean to me?



Have you ever tried to connect your PCs, VAXes, UNIX machines, and mainframes but been unable to because they each run different network protocols? Maze is about overcoming that barrier. We believe Maze is the largest demonstration of real-time, multi-protocol, client/server connectivity ever staged.

How does it work?

In Maze, game stations communicate with each other, and ORACLE7 databases from their native environments: (O/S, protocol, windowing software). Any differences in client and server networks are resolved by Oracle's SQL*Net V2 and MultiProtocol Interchange products. Stations communicate as applications independent of the protocol they use.



How did Maze happen?

Interop and its participants were looking for ways to increase live network use on the show floor in a meaningful, easily understood way. As one of the world's largest vendors of networked applications, Oracle Corporation proposed Maze.



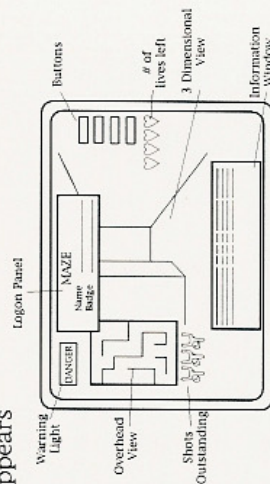
What do I get if I play?



An eye for an eye as they say. The Oracle booth has a must-have floating eye giveaway for anyone who plays the game. Additional hourly and daily high-score winners will be announced receiving Maze T-shirts and Sharp Wizards respectively.

What do I need to know to play?

The screen appears as follows:



Use the two page centerfold on the following page when playing the game.

What's going on in the game?

In maze, you are an eye competing against other eyes inside a 3 dimensional maze. Players are identified by different colors representing their network protocols and physical booth locations.

How do I begin?

Find a Maze game station and watch the screen to get oriented. To begin playing, Enter your name and Badge ID in the logon window and press "Start".

Maze Rules



+10 Players in the Maze are eyes. Eyes are the most skillful opponents because they are just like you.



+5 Robots are automated players that wander through the Maze and shoot when they see others. They are slow, and quite predictable.



+2 Also in the Maze are "sitting" ducks. They move, but don't shoot.



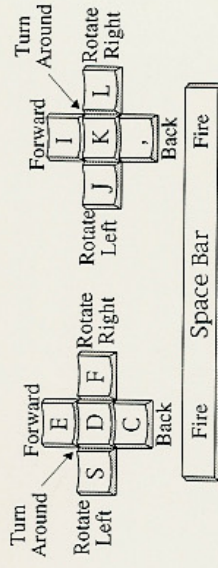
-1 You are armed with magic slingshots. When used, they remain where they are fired for one second before actually firing. This gives potential victims one second to reach safety. When you are fired upon, a danger light flashes warning that a shot will come within one second.



After being shot, you are teleported to another location in the Maze. Be prepared to move quickly, you may land near another player! Each player can be shot up to 4 times before the game is over.

Valid Keys

Use either the right or left hand key map. On most computers, arrows also work.



Maze Hints



Watch the 3-D screen. This is where the game is won or lost. The navigation keys only make sense in the 3-D view.



Keep Moving. A moving target is harder to shoot. If you do nothing for 1 minute, you are logged off.



Run. Holding down the "forward" or "backwards" key allows you to "run" down a corridor.



Learn about the magic slingshot. Understanding the slingshot is fundamental to game strategy.



Sharing Space. When the screen inverts you are in the same space as another player. Move quickly!

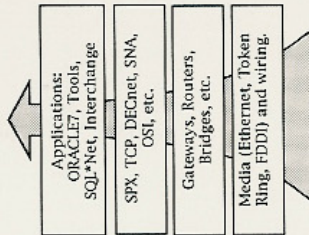


Don't loiter in long corridors. These are the deadliest (and most opportunity filled) places in the maze.



Run at the shooter ... if you think you can get behind him within one second. The shot will then miss you when it fires.

What can I learn about Oracle from Maze?

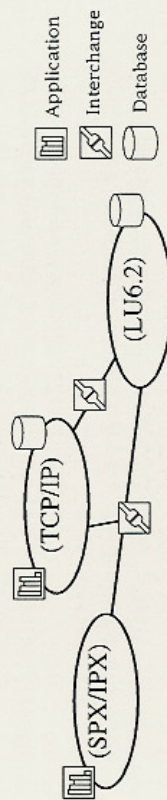


Oracle's business is providing industrial strength, real-world business applications running over your communications infrastructure of routers, bridges, and wiring. In Maze we show:

- * Network software that can run on any machine over any protocol, and communicate between unlike protocols for client/server processing.
- * A distributed ORACLE7 database logging and querying all data transactions on behalf of the game.
- * A portable user interface supporting Windows, Mac, X-Windows, Motif, OpenLook, and DECwindows.

What do you mean "between unlike networks"?

Simply put, any client and any server in any networks can communicate. For example, a network of PCs, UNIX workstations, and mainframes using Novell SPX/IPX, TCP/IP, and LU6.2 respectively can freely intercommunicate for client/server applications. The Interchange allows connections to span unlike networks.



Any final words?

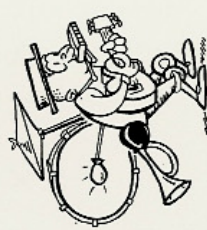
The most interesting thing about Maze is that it shows many of the vendors at INTEROP™ 92 actually interoperating. Maze combines many vendors products into a symphony of integrated network technologies.

How can I find out more?

Come to Interop booth #1012 to see Oracle in action, or see one of our hourly presentations. Additionally Maze clients are running in over 50 booths around the show floor. Find a station and try it!

Who else is participating in Maze at INTEROP?

3Com Corporation	Coral Network Corporation	Newport Systems
AGE Logic, Inc.	Distinct Corporation	NYNEX ALLINK
Aggregate Computing	EcoSystems Software Inc	Process Software
AMP EOP Group	EICON Technology	PSI
Asante Technologies, Inc	Farallon Computing, Inc.	RAD Data Comm
Ascend Communications	Frontier Technologies	RAD Network Devices
Auspex Systems, Inc.	Hewlett-Packard Company	Sigma Network Systems
BBN Communications	InteCom, Inc.	SysKonnect, Inc.
Beame & Whiteside Software	IWI	Telebit Corporation
Bridgeway Corporation	LARSE	Tenon Intersystems
Brixton Systems	Motorola Codex	TGV, Inc.
Canary Communications	NEC America, Inc.	Thursby Software
Centrum Communications	Netcor	Vitalink Comm
Clearpoint Research	NetFRAME Systems, Inc.	Walker Richer & Quinn
Compatible Systems	Netrix	The Wollongong Group
Computer Network Tech	N.E.T.	

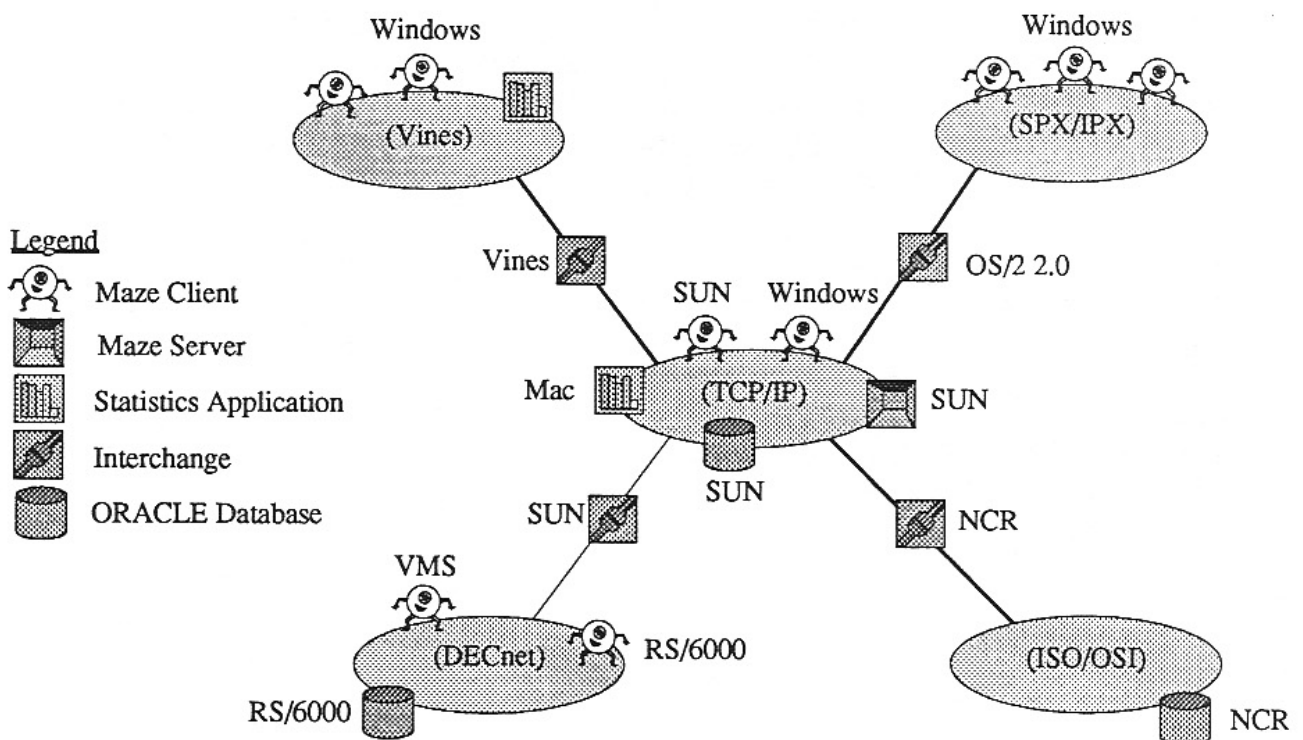


Oracle at INTEROP 92

Look around you. The annual fall INTEROP show is featuring an impressive display of computers and communications equipment working together – interoperating as the theme of the show dictates. As the multi-vendor nature of INTEROP reveals some promise for the future of "open systems" and the increasing viability of heterogeneous networks, a question still remains: how easily can *applications* network?

Oracle Has Arrived – Let the Game Begin

At this year's INTEROP '92 in San Francisco, Oracle Corporation, always a good sport and ready to compete, invites you to participate in Maze, an interactive game that demonstrates a distributed application network. With the assistance of the show organizers, Oracle is demonstrating a distributed application that is seamlessly integrated across the many diverse computer and communications technologies connected on the INTEROP network. In what could be billed as the first live, hands-on, multi-platform, multi-vendor, multi-protocol application at INTEROP, or perhaps any trade show, Oracle's demonstration shows how PCs, workstations, and minicomputers can be successfully integrated into a single distributed application network – the goal of most large corporations today.



The Maze Layout at INTEROP

Want to Play Around?

It's fun, but it's serious fun. As a player at one of the participating PCs or workstations, you can test your savvy and your lightning reflexes against other players at other PCs and workstations scattered throughout the exhibit hall. You also can get hands-on experience with an Oracle application network. Making the distributed application possible are Oracle's new relational database technology, ORACLE7, and Oracle's multiprotocol networking software. Oracle graphics technology enables the application to adapt to the look and feel of the native graphical environment.

Why Play Games?

The Maze game structure simulates the real needs and issues of a business production environment. For instance, global competition and the rapid pace of business demands that applications be designed, developed, and deployed quickly. Applications must be adaptable to diverse and rapidly changing technologies. They must offer ease-of-use and accessibility from a variety of platforms. They must cross protocols transparently. The Oracle implementation of the Maze game at INTEROP meets all these requirements.

Beyond the Game: Playing for Keeps

Even though Oracle is using a simple game to show an interactive, distributed database application, very sophisticated technology underlies the demonstration. The Maze, deployed in a simulated production environment using equipment from many different vendors, shows how an ORACLE7 application can meet the needs of businesses today. Oracle takes this game – the one in which businesses compete every day – very seriously. Through Maze, users can see a way to play for keeps as Oracle shows how its industry-leading database and networking technology can be used to create an enterprise-wide information system.

Come to the Maze Control Center, Booth 1012, to get more information about the game and the Oracle technology that makes it possible.

ORACLE

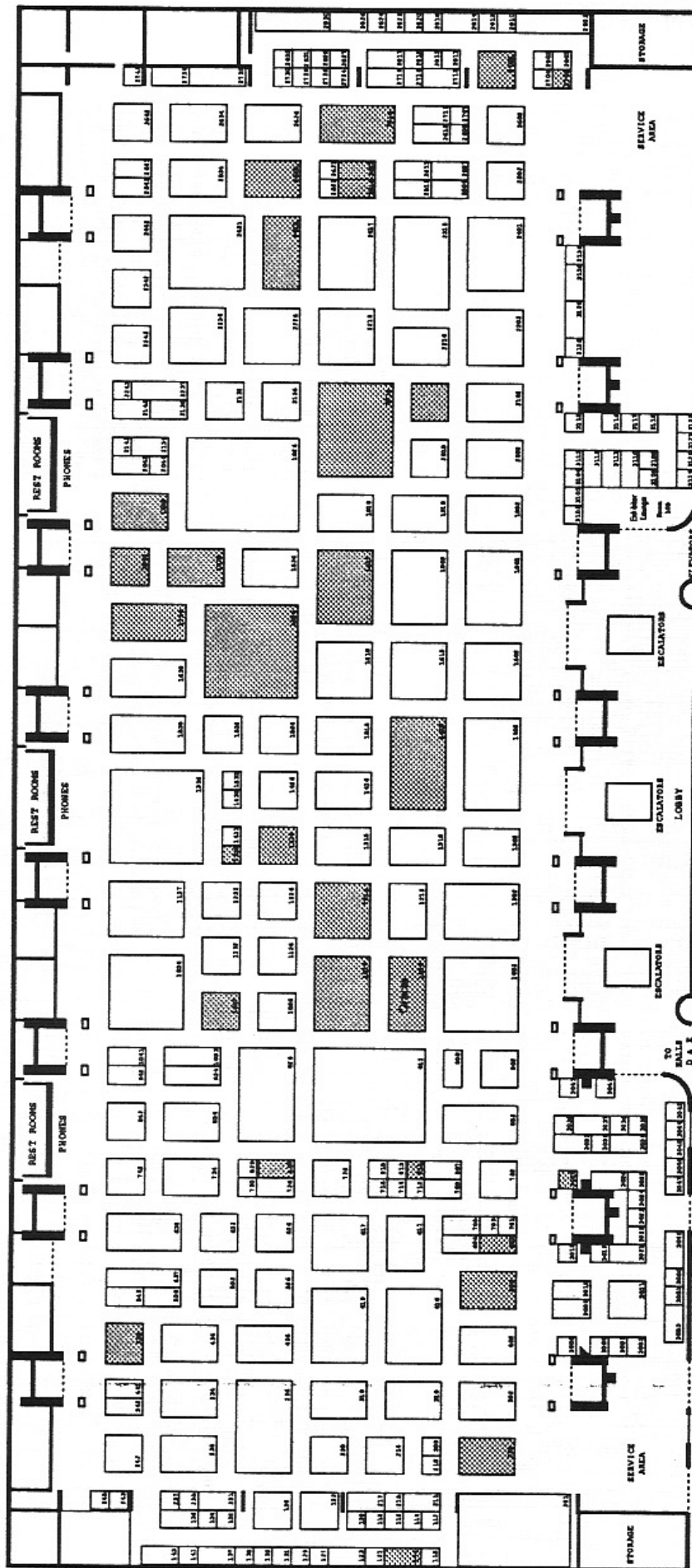
NETWORK PRODUCTS DIVISION

INTEROP Booth 1012

MAZE PARTICIPANTS

With

ORACLE



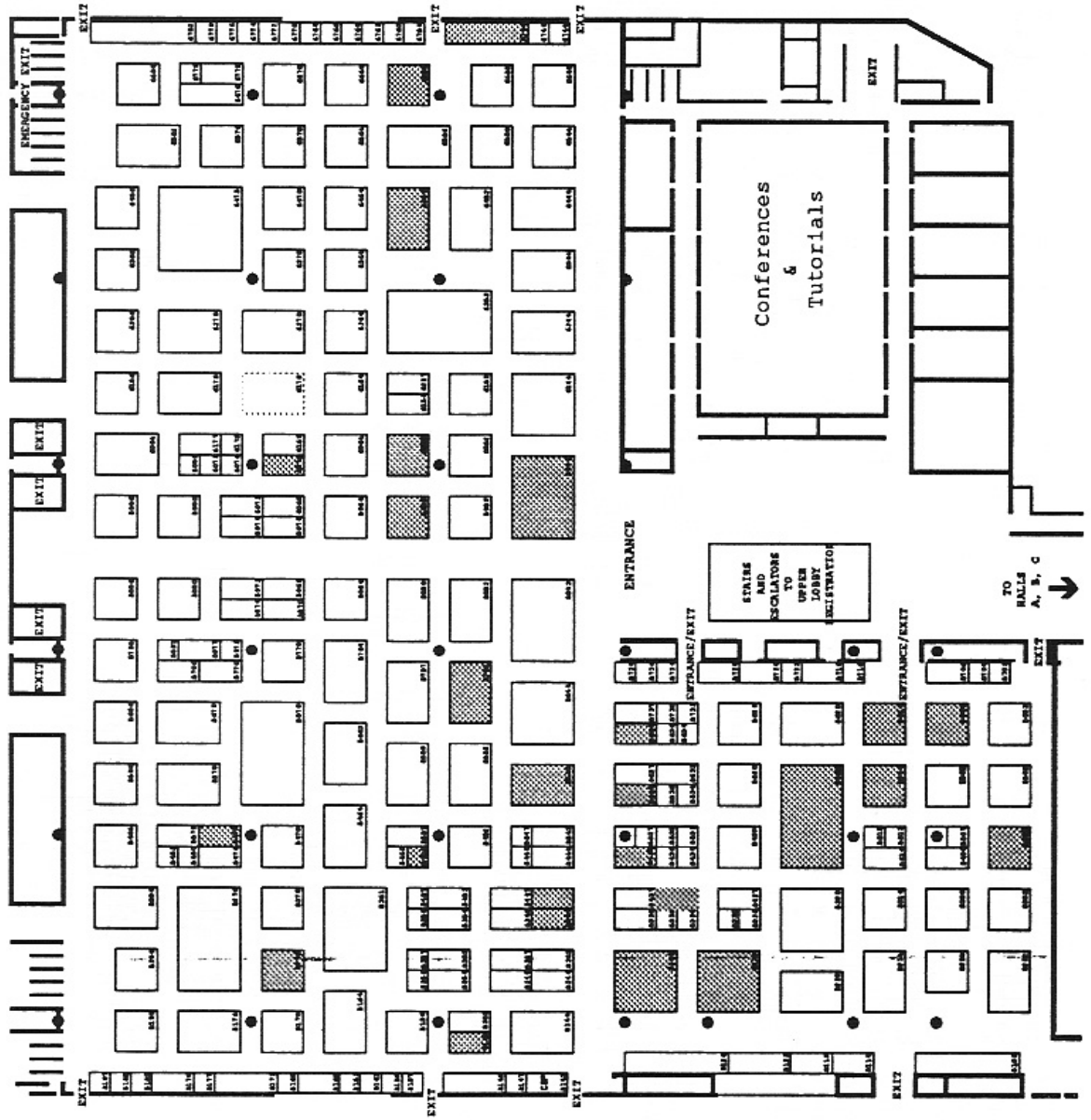
SOUTH HALL

Revised 10/9/92



26-30 October 1992 • Moscone Convention Center • San Francisco, CA

MAZE PARTICIPANTS with ORACLE®



NORTH HALL

Revised 10/9/92

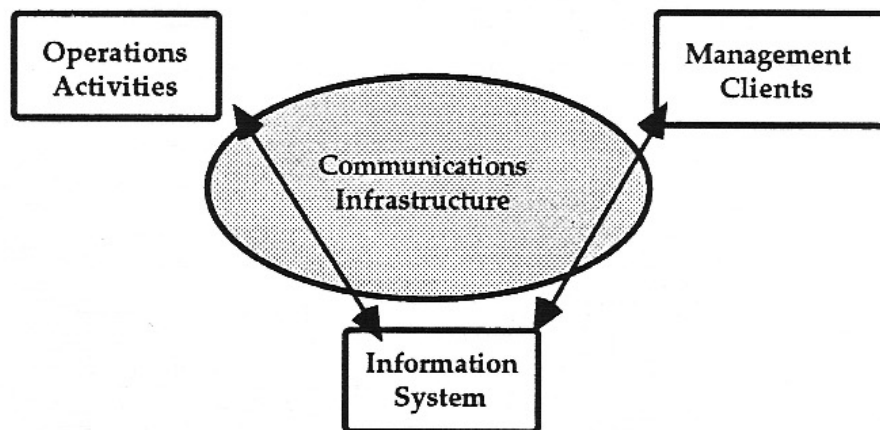
The Oracle INTEROP Demo

A Technical Perspective

The Purpose of the Demo

Although the distributed application demonstrated at INTEROP is a simple game, it illustrates the technical solutions that make possible a distributed application network. The demonstration illustrates how distributed applications can be constructed to use networking technologies within real-world situations.

This paper presents several technical issues associated with the networking components of distributed applications, and relates them to the architecture of the demonstration system. It shows how the game environment incorporates solutions that can also be applied to production environments in "the real world."



The Nature of Maze

For demonstration at a trade show, a distributed application must meet a number of requirements not normally encountered in the business world. It must be easy to use, with no training required, and must be visually attractive and interesting. A graphics-based game was chosen to meet these requirements.

Underneath the veneer of the game format, Maze demonstrates the kinds of architecture and technologies needed for distributed applications in production environments. The Maze game, written in the early 1970s, is possibly the first

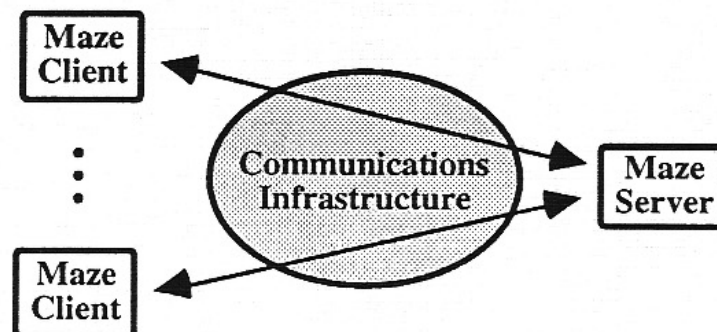
client-server application ever written and widely used, even before the term "client-server" existed.

The Maze distributed application consists of four elements:

- The Maze game application itself, including Maze Clients and Maze Server;
- The Information System, which tracks the activities during the show;
- The Management Clients, which allow the game activities to be watched and analyzed;
- The Communications Infrastructure, which allows the three functions above to be distributed across a multi-protocol networking environment.

The Maze Application

The game screen itself on each individual Maze client game station maintains the display, reads the player's commands to start the game, to move through the maze and so on, and communicates with the Maze Server. The Maze Server handles the administrative tasks associated with each player entering and leaving the game, and acts as a central clearinghouse to report the information about each player's actions, such as moves through the maze, to all other clients.



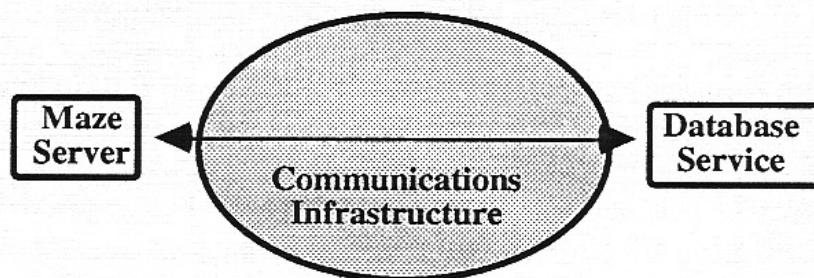
The Maze Clients are written using Oracle's underlying technology for portability, which permits the Clients to run on a variety of vendors' equipment, and a wide range of architectures. For the INTEROP show, DOS/Windows PCs and a variety of workstations are used to illustrate this portability.

With an eye toward nostalgia, the Maze Server was created using the original listings of the Maze program from the early 1970s, adapted to run in a UNIX

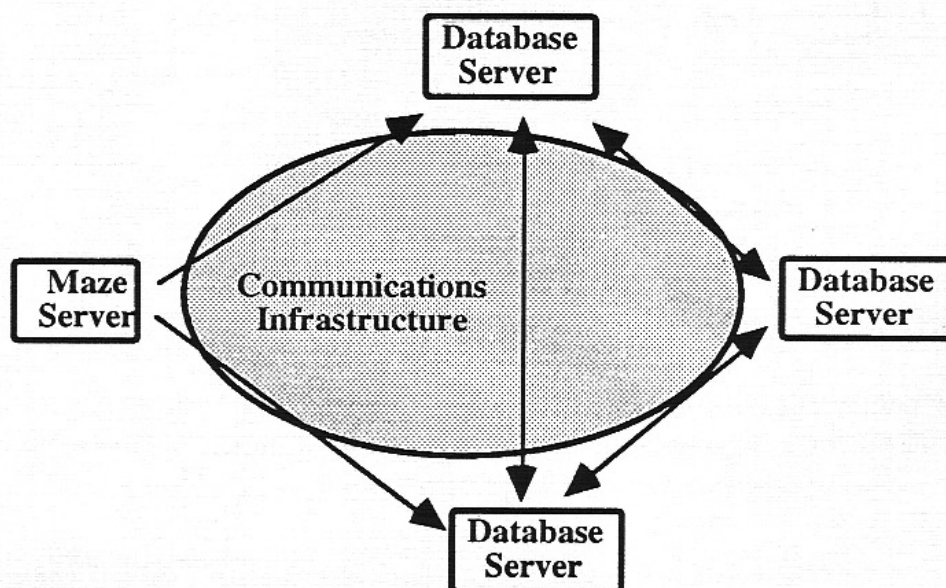
environment and to use the Communications Infrastructure for multiprotocol network environments.

The Information System

In order to keep track of the game activities, the Maze Server communicates with the Database Service, using the same Communications Infrastructure as is used between the Maze Clients and Maze Server. Information such as players' names, location from which they played the game, scores, and the like are maintained using the Database Service.



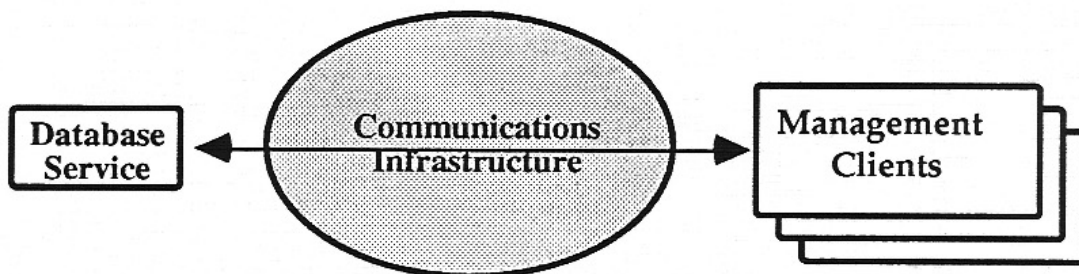
Production environments, especially distributed ones, often require use of machines in scattered locations. Although this is not an issue on a trade-show floor, in order to illustrate the use of distributed applications in the real world, the actual Database Service for the Maze game is implemented as a distributed database, using several separate machines from different vendors, using different network protocols, and ORACLE7™ distributed database technology.



The effect of this structure is largely invisible to the clients of the Database Service, as it should be. The Maze Clients and Server and the Management Clients (discussed below) see a single, highly reliable *service*, which they access using the Communications Infrastructure. Neither they, nor the programmers building their software, need to know the inner details of how the data is managed by the several machines involved.

The Management Clients

In the Maze game at INTEROP, information about the events and players in the game is used for activities such as awards for high scores. Management Clients provide access to this information, which is stored by the Database Service. These clients, on graphics-mode terminals scattered throughout the exhibit area, use the Communications Infrastructure to access the Database Service. This is a true distributed database system, in which the database is maintained on several separate machines from different vendors using different network protocols, and the clients are similarly implemented on separate machines using diverse network protocols. The overall effect, however, is of one single distributed application, both from the end-users' perspective and the programmers'.



The Communications Infrastructure

The Communications Infrastructure is at the core of all of the diagrams above, providing the underlying networking capabilities that enable the creation of distributed systems across a range of machines and network environments.

In today's programming world, the requirements for "open" environments dictate that applications must be written in such a way that they do not require,

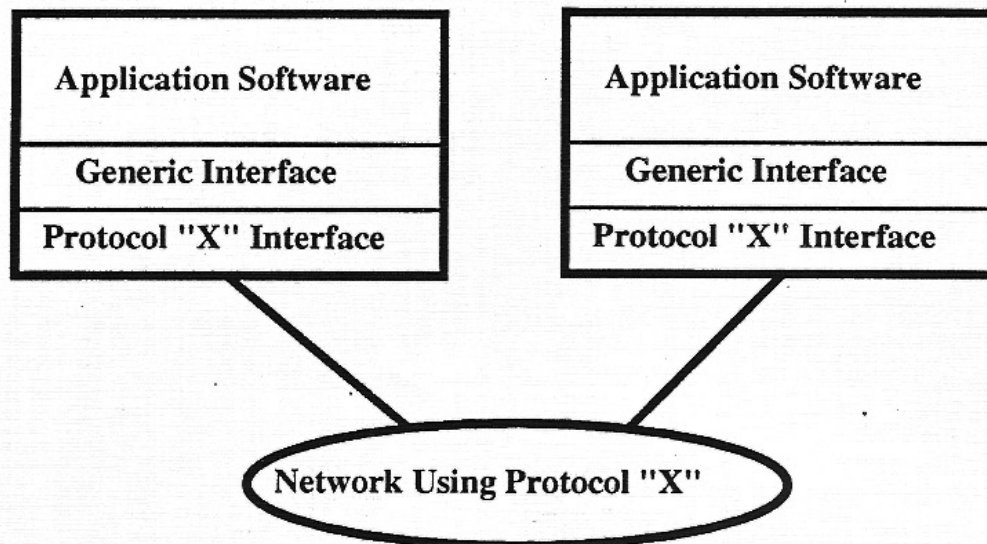
or depend upon, the specific network protocols or product-specific interfaces of any particular vendor. Applications should permit the use of the equipment and network environments available to them now, as well as those that may be prevalent in the future. Two problems must be solved in order to create an application viable for distributed production environments.

Generic Network Interface

The first problem results from the many implementations of the protocols available today. There are many different protocols, both "public," such as OSI and TCP/IP, and proprietary, such as Novell SPX/IPX, Banyan VINES, and IBM APPC. Within a single protocol, and within a single machine, there are often several distinct implementations of that protocol, from different vendors. Often each of these separate implementations has a different program interface; TCP/IP for the DOS/PC environment, for example, is available from dozens of vendors, with almost as many separate programming interfaces.

Creating a distributed application in such an environment can involve innumerable separate modules to be written, one for each specific implementation of each protocol on each kind of computer that may be used over the lifetime of the application. This situation results in long application development cycles, which are unacceptable in competitive business environments. The alternative approach, supporting a very limited number of protocols and products, results in the plethora of applications today that cannot operate in common environments – PC-based programs which are not available on UNIX, mainframe-based applications which cannot be run in Windows PCs, and others.

To allow true distributed applications, the Communications Infrastructure includes a generic interface, which is identical on all computing platforms, and which knows how to interface with the diverse implementations of the numerous protocols available today. A distributed system has the architecture shown below.



The Communications Infrastructure includes a generic interface, and a specific interface for a specific protocol, on each computer involved in the application. The application software is written to use the generic interface – and thus the effort spent in writing the application program focuses on the application itself, rather than on the housekeeping details of the myriad network environments.

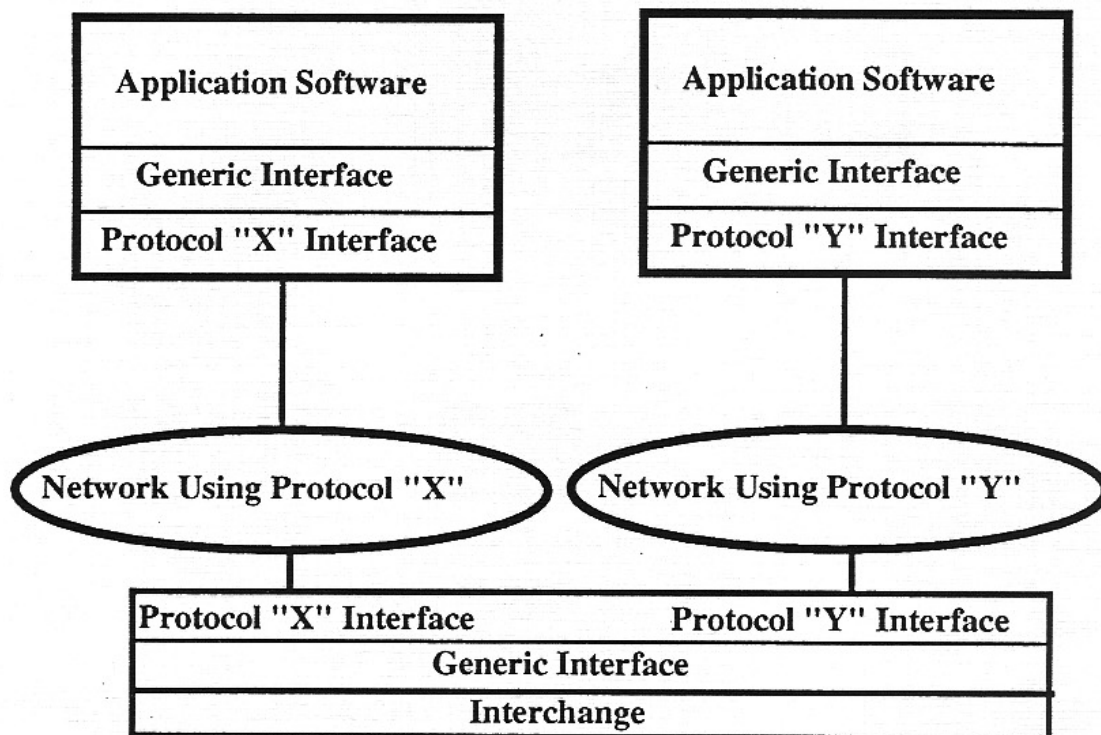
The generic interface within the Maze application is part of Oracle's *Transparent Network Substrate* (TNS). TNS is also used within Oracle products to implement the communications for distributed systems. Existence of the Transparent Network Substrate was critical in enabling the Maze application for INTEROP to be written within the time available.

Multiprotocol Support

The second major problem to be solved in building enterprise-wide distributed systems results from the multi-protocol nature of the computing world. Network equipment, such as switches, routers, and bridges, now provides widespread connectivity using virtually every protocol. Interconnecting applications in this environment is problematical, however, because until now applications could communicate only with others using the same protocol. LAN environments typically use a LAN-based protocol, such as SPX or LAN Manager. Glass-house environments are usually based on SNA, DECnet, and similar systems. Standards such as OSI and TCP/IP are widespread, but often expensive or unwieldy to use in addition to a LAN protocol.

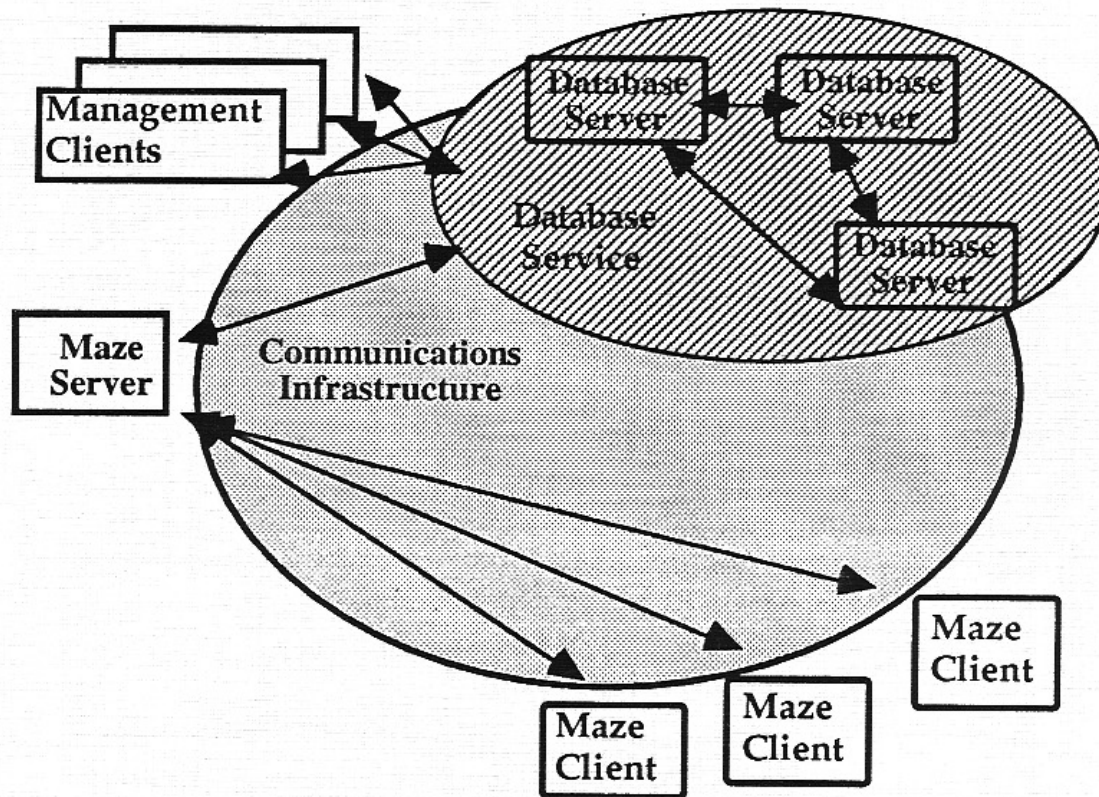
In order to build distributed applications, the applications developer must be insulated from the vagaries of multi-protocol environments. Any client or server, running on any particular machine and using any particular protocol, must be able to interact with any other clients or servers on other machines using other protocols.

In the Maze application environment, the mechanisms that provide this interoperability are implemented as part of the Communications Infrastructure. TNS allows communications between two components of a distributed application over any protocol, and the *Multiprotocol Interchange* allows the communications to occur even if the same protocol is not in use by all of the participants, as shown below.



The Interchange, which allows cross-protocol connectivity for use by the distributed application, is a software component that is placed on a machine that supports whatever protocols are in use within the application's environment. The application software still uses the Transparent Network Substrate to communicate; the Interchange is deployed only if there is more than one protocol in use by the various computers on which the application runs.

In the Maze application at INTEROP, clients and servers are deployed using several protocols, including TCP/IP, DECnet, and SPX/IPX. The various components of the distributed application, including the Maze Clients and Server, Database Servers, and Management Clients, all use the Communications Infrastructure to permit the necessary communications to occur, even if the various machines do not use a common protocol. The following diagram of the Maze distributed application network shows how all the parts communicate:



Summary

Oracle has developed the Maze demonstration to show what is possible when you apply Oracle's advanced communications technology in a large heterogeneous networking environment. Applications can be deployed enterprise-wide with no special coding or administrative procedures. Oracle is the only company capable of delivering practical database solutions in a multi-platform, multi-vendor, multi-protocol environment.

Enjoy the Maze game! Then stop by the Maze Operations Center in the Oracle booth, #1012, to find out more about Oracle's exciting technology and what it can mean to your organization. And be sure to attend a Presentation Theater session on the Maze; these will be held on Wednesday and Thursday from 1:15-1:50 in Room 122.

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All trade names referenced are the service mark, trade mark, or registered trademark of the respective manufacturer.

