

f w f < f v f g f s f b f N , ì ^ ê — — , ð • \ Ž ! , , é , É , [□ A [f w f < f v] , ì [f g f s f b f N , ì Ç È Ï □ ð] , ð f N f Š f b f N , μ , Ä , , ¾ , ³ , ç □ B

DirectX

Microsoft® DirectX®

DirectX

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DirectX fRf"fi"flf"fg.ìfefXfg.đs.ğ

Šù'è.ì"®ì.đ•ïX. .é

fhf%ofCfo.đ•œĈ³. .é

î•ñ.đ•Û'ŋ. .é

-â'è.đ•ñ. .é

DirectX 11.1

DirectX® 11.1 is a collection of APIs for rendering 3D graphics and audio. It includes the Direct3D 11 API for graphics, the DirectSound and DirectMusic APIs for audio, and the DXGI and DirectInput APIs for display and input. DirectX 11.1 is available for Windows 7, Windows 8, and Windows 8.1. It is also available for Xbox One and Xbox Series X/S. DirectX 11.1 is a significant update to the DirectX 11 API, adding new features and improving performance. It includes the Direct3D 11.1 API, which is the core of the graphics stack. It also includes the DirectSound and DirectMusic APIs, which are used for audio. DirectX 11.1 is a key component of the Windows operating system and is used by many applications and games. It is a critical part of the DirectX ecosystem and is essential for running many of the most popular games and applications on Windows and Xbox. DirectX 11.1 is a significant update to the DirectX 11 API, adding new features and improving performance. It includes the Direct3D 11.1 API, which is the core of the graphics stack. It also includes the DirectSound and DirectMusic APIs, which are used for audio. DirectX 11.1 is a key component of the Windows operating system and is used by many applications and games. It is a critical part of the DirectX ecosystem and is essential for running many of the most popular games and applications on Windows and Xbox.

-â'è,ìĈ'ö,ð'Á'è,-,é

DirectX fAfvfŠfP[fVf#f", ìŽÀ[s't,É-â'è,ª"□¶,μ,½□ê□#,í□ADirectX □f'ffc□[f<,ðŽg,α,Æ-â'è,ìĈ'ö,ð'Á'è,À,«,Û,·□BŽŸ,ì,æ,α,É-â'è,ª,È,ç,©Šm"F,μ,Ä,,¾,³,ç□B

□ ĈÈ,Á,½fo□[fWf#f", ì DirectX fRf"fí□[fif"fg□B[DirectX ftf@fCf<] f^fu,ì ['□^Ó) ,Á□AfX□[f^ ftf@fCf<,âfffofbfO ftf@fCf<,ÉŠÖ,·,éĈEx□□,ª,È,ç,©Šm"F,μ,Ä,,¾,³,ç□BfX□[f^ ftf@fCf<,í□%Šú,ìfexfg— pfo□[fWf#f", Á□A□α—pfAfvfŠfP[fVf#f",Æ<α,ÉfCf"fXfg□[f<,·,×,«,à,ì,Á,í, ,è,Û,¹,ñ□BfffofbfO fo□[fWf#f", ìfvf□fOf%of€ ,ðŠ] ,·,é□Û,ÉŽg,í,è,éftf@fCf<,Á□A,±,è,à□Á□□»·i,Æ<α ,ÉfCf"fXfg□[f<,·,×,«,à,ì,Á,í, ,è,Û,¹,ñ□BfffofbfO fo□[fWf#f", ìfRf"fí□[fif"fg,ªfCf"fXfg□[f<,³,è,Ä,ç ,é,Æ□A□»·i"Á,ªfCf"fXfg□[f<,³,è,Ä,ç,é□ê□#,æ,è,àfAfvfŠfP[fVf#f", ìŽÀ[s't—"x,ª'á•□,É'á%º,·,é,±,Æ,ª, ,è, Û,·□B

□ "F'è,³,è,Ä,ç,È,çfhf%ofCfo□B[DirectX fhf%ofCfo] f^fu,ìftf@fCf<,ì^ê—,Á□A-ç"F'è,ðŽì,·f}□[fN,ª\ Žì,³,è,Ä,ç,éfhf%ofCfo,ª,È,ç,©Šm"F,μ,Ä,,¾,³,ç□B[fffBfXfvfĈfC]□A[ftfEf"fh]□A,·,æ,Ñ ["ü—í] f^fu,ì ['□^Ó) ,É,à□A,» ,ì¼,ì-â'è,ªŽì,³,è,Ä,ç,é□ê□#,ª, ,è,Û,·□B-ç"F'è,ìfhf%ofCfo,í□A□Á□Vfo□[fWf#f", ì DirectX ,ÆŠ@'S,ÉĈŸŠ·□<,ª, ,é,©,ç,α,©,ðf}fCfNf□\ftfg,É,æ,Á,ÄfefXfg,³,è,Ä,ç,Û,¹,ñ□B

□ fn□[fhfEfFfA fAfNfZf%ofĈ□[f^,ìĈ#@"B^è•", ìfvf□fOf%of€,í□ADirectDraw® ,Û,½,í Direct3D® fn□[fhfEfFfA fAfNfZf%ofĈ□[f^,ª—~—p,Á,«,È,ç,Æ□AŽÀ[s't—"x,ª"ñ□í,É'á%º,·,é,©□A,Û,½,í,Û,Á,½,- "©□,μ,Û,¹,ñ□B[fffBfXfvfĈfC] f^fu,ì [DirectX,ì<@"\] ,Á□ADirectDraw ,Û,½,í Direct3D ,É "Žg—p%ºÁ"\ ,ÉfAfNfZf%ofĈ□[f^,È,μ" ,Æ•\Žì,³,è,Ä,ç,È,ç,©Šm"F,μ,Ä,,¾,³,ç□B•\Žì,³,è,Ä,ç ,é□ê□#,í□Afn□[fhfEfFfA, ìfAfbfvfOfĈ□[fh,ðĈŸ"ç,μ,½,Û,α,ª,æ,ç,©,à,μ,è,Û,¹,ñ□B

□ fffofCfX,ª□Ú'±,³,è,Ä,ç,È,ç□BfWf#fCfXfefBfbfN,È,ç,ì"ü—ífffofCfX,ª%ºž"š,μ,È,ç□ê□#□A□³,μ,- fZfbfgfAfbfv,³,è,Ä,ç,È,ç%ºÁ"\□<,ª, ,è,Û,·□B,»,ìfffofCfX,ª□ADirectX □f'ffc□[f<,ì ["ü—í] f^fu,É•\Žì,³,è,Ä,ç ,é,©,ç,α,©Šm"F,μ,Ä,,¾,³,ç□B•\Žì,³,è,Ä,ç,È,ç□ê□#,í□Afrf"fg□[f< fplf<,ðŽg,Á,ÄfffofCfX,ð'ç %ºÁ,μ,Û,·□B

DirectX fRf“f|□[flf“fg,lfefXfg,đ□s,κ

DirectX □f’ffc□[f<,đŽg,Á,Ä□AfVfXfef€É□Ú’±,³,ê,Ä,ç,éŠef,fjf^,Á,ì DirectDraw ,“,æ,Ñ Direct3D
,lfefXfg□AŠe WAVE □o—ÍfffofCfX,Á,ì DirectSound® ,lfefXfg□A,“,æ,ÑŠef~f...□[fWfbfN f|□[fg,Á,ì
DirectMusic™ ,lfefXfg,đ□s,κ,±,Æ,ª,Á,«,Ü,·□B

[lfefXfg] ,đfNfŠfbfN,·,é,Æ□Af□fbfZ□[fW,ª\Ž!,³,ê,½CEã□Af,fjf^,â□o—
ÍfffofCfX,ÁfefXfg,ªŽÀ□s,³,ê,Ü,·□BfefXfg,ª□—CE÷,μ,½,©,Ç,κ,©,đŠm”F,·,é□fbfZ□[fW,ª\
Ž!,³,ê,é,Ü,Á□A,»ê,¼,ê,lfefXfg,đŽÀ□s,³,¹,Ü,·□B[,ç,ç,|]
,đfNfŠfbfN,μ,½□ê□#,í□A,»ê,ê^É□āfefXfg,ÍŽÀ□s,³,ê,Ü,¹,ñ□B

DirectMusic ,ì□ê□#,í□A’P^ê,lfefXfg,ª□s,í,ê,Ü,·□B%%o’t,³,ê,½%o¹Šy,É-â’è,ª,È,ç□ê□#□A,Ü,½,í□³,μ,%o
%o’t,³,ê,È,ç□ê□#□A’P,É [OK] ,đfNfŠfbfN,μ,Ü,·□B

□î•ñ,đ•Ú’¶,μ,Ä,à□AfefXfg,ìCE<%oÊ,í•Ú’¶,³,ê,Ü,¹,ñ□B

Šù'è,ì"®ì,ð•ïX,·,é

fVfXfeJÉ,ÉfCf"fxfg[]f<,³,è,Ä,ç,éŠefffBfXfvfCEfC fffofCfX,É'í,·,é [fffBfXfvfCEfC] fy[]fW,Ä [-³CEø]
,ðNfŠfbfN,·,é,Æ[]ADirectDraw ,Ü,½,í Direct3D (—~—p%Ä"\,É[]é[]#) ,ìfn[]fhhEjFfA fAfNfZf%ofCE[]f^,ð-
³CEø,É,·,é,±,Æ,ª,Ä,«,Ü,·[]B-³CEø,É,µ,½fAfNfZf%ofCE[]f^,í DirectX []f'ffc[]f<,ð[]—
¹,µ,½CEä,à,»,ì,Ü,Ü,Ä[]AfAfVfŠfP[]fVf#f", ©,ç—~—p,·,é,±,Æ,í,Ä,«,Ü,¹,ñ[]BfAfNfZf%ofCE[]f^,ð,à,æ"è"x—
LCEø,É,·,é,É,í[]A[-LCEø] fNfŠfbfN,µ,Ü,·[]B

'[] : DirectDraw fAfNfZf%ofCE[]f^,ð-³CEø,É,·,é,Æ[]ADirect3D ,ìfAfNfZf%ofCE[]f^,à-³CEø,É,É,è,Ü,·[]B

,Ü,½[]ADirectDraw ,ì'S%æ-Ê•ŽìfAfVfŠfP[]fVf#f"Žg—pŽž,ìf,ffj^,ìfŠftfCEfbfVf... fCE[]fg,ð•ïX,·,é,±
,Æ,à,Ä,«,Ü,·[]B,±,ì•ï[]X,í[]A"Á'è,ìfAfVfŠfP[]fVf#f",ÄfffBfXfvfCEfC,ÉŠÖ,·,é-à'è,ª"[]¶,µ,Ä,ç
,Ä[]A,»,ìfAfVfŠfP[]fVf#f",ª-³CEø,ÉfŠftfCEfbfVf... fCE[]fg,ðŸ'è,µ,Ä,ç,é,ÆŽv,í,é,é[]³"-,É—[]—
R,ª, ,é[]é[]#f,É,¾,³,³,ç[]B

▶ **fŠftfCEfbfVf... fCE[]fg,ð•ïX,·,é,É,í**

1. [,»,è,Ä,à-à'è,ª%øðCE^,µ,È,ç[]é[]#] f^fu,Ä[]A[[]ä[]',«] ,ðfNfŠfbfN,µ,Ü,·[]B
2. [DirectDraw fŠftfCEfbfVf... fCE[]fg,ì[]ä[]',«] f_fCfAf[]fO f{fbfNfX,ÄfGfffBfbfg
f{fbfNfX,ð'í'ð,µ[]Af,ffj^,É'í,µ,Ä—LCEø,ÉfŠftfCEfbfVf... fCE[]fg,ð"ü—í,µ,Ü,·[]B,±,ìf{fbfNfX,É'í,ð"ü—
í,·,é,Æ[]A[[]ä[]',«'í] ,ªŽ©"®"í,Éfjf",É,É,è,Ü,·[]B
3. [OK] ,ðfNfŠfbfN,µ,Ü,·[]B

▶ **fŠftfCEfbfVf... fCE[]fg,ì•ïX,ðžæ,è[]Á,µ,Ä[]ADirectDraw
fAfVfŠfP[]fVf#f",ª"ÆŽ©,ìfŠftfCEfbfVf... fCE[]fg,ðŸ'è,Ä,«,é,æ,æ,æ,É,·,é,É,í**

1. [,»,è,Ä,à-à'è,ª%øðCE^,µ,È,ç[]é[]#] f^fu,Ä[]A[[]ä[]',«] ,ðfNfŠfbfN,µ,Ü,·[]B
2. [DirectDraw fŠftfCEfbfVf... fCE[]fg,ì[]ä[]',«] f_fCfAf[]fO f{fbfNfX,Ä[]A[Šù'è'í] ,ðfjf",É,µ,Ü,·[]B
3. [OK] ,ðfNfŠfbfN,µ,Ü,·[]B

fhf%ofCfo,đ•œCE³,·,é

□\□¬,É,æ,Á,Ä,Í□A DirectX® □f'ffc□[f<,Á□A^È'O,ìf□[fffBfì fhf%ofCfo,¨,æ,Ñfrfffl fhf %ofCfo,đ•œCE³,Ä,«,Ü,·□Bfhf%ofCfo,ì"ñCEÝŠ·□«,ì-â'è,ì%oðCE^,É,Í□A,±,é,ª□Ä,à,æ,¢•û-@,Ä, ,é□ê□‡,ª, ,è,Ü ,·□B

[,»,é,Á,à-â'è,ª%oðCE^,µ,È,¢□ê□‡] f^fu,É [•œCE³] f{f^f",ª\Ž!,³,è,Ä,¢,é□ê□‡,Í□A,± ,ìf{f^f",đfNfŠfbfN,µ□ADirectX fZfbfgfAfbfv fv□fOf%of€,đŽÀ□s,Ä,«,Ü,·□B

DirectX fZfbfgfAfbfv,É,Í□A[fì□[fffBfì fhf%ofCfo,ì•œCE³] ,Æ [fffBfXfvfCEfC fhf%ofCfo,ì•œCE³] f{f^f",ª, ,è,Ü,·□B,¢, ,è,©,ìf{f^f",đfNfŠfbfN,·,é,Æ□AfvfXfef€,É DirectX

,đfCf"fXfg□[f<,µ,½,Æ,«,É'u,«Š·,!,ç,è,½fhf%ofCfo,ª•œCE³,³,è,Ü,·□Bf{f^f",ªŽg—p%oÂ"\
,Ä,É,¢□ê□‡,Í□A•œCE³,·,éfhf%ofCfo,ì, ,è,Ü,¹,ñ□B,»,ì□ê□‡,Í□Afn□[fhfEfffA,ì□»'¢CE³,É-â,¢□‡,í,¹,Ä□Ä□V,ìfhf %ofCfo,đ"üŽè,µ,Ä,,¾,¾,³,¢□B

DirectX fZfbfgfAfbfv,É,Í□ADirect3D fn□[fhfEfffA fAfNfZf%ofCE□]f^,đ-

³CEø,É,·,éf fFfbfNf{fbfNfX,à, ,è,Ü,·,ª□A ,±,é,Í□ADxDiag "à,Ä,à□s,±,Æ,ª,Ä,«,Ü,· (Šù'è,ì"®□ì,đ•í□X,·,é ,đŽQ□Æ,µ,Ä,,¾,¾,³,¢)□B

□î•ñ,ð•Û'¶,·,é

DirectX □f'ffc□[f<,ªŽú□W,μ,½□î•ñ,ð•Û'¶,·,é,É,Í□A2 ,Â,ì•û-@,ª, ,è,Û,·□B

□ [□î•ñ,ð,·,×,Ä•Û'¶] ,ðfNfŠfbfN,μ,Û,·□B,·,×,Ä,ìfy□[fW,ì□î•ñ,ª□AZw'è,μ,½□ê□Š,É, ,éŽw'è,μ,½-¼'O,ìftf@fCf<,É•Û'¶,ª,è,Û,·□B

,±,ìfc□[f<,ìŠJ"ŽÒEü,~fšfš□[fX,ðŽg,Á,Ä,ç,éftfgfEfFfAšJ"ŽÒ,Â, ,é,Í□AZÿ,ì•û-@,ð,Æ,é,±,Æ,à,Â,«,Û,·□B

□ [,»è,Â,à-â'è,ª%øðCE^,μ,È,ç□ê□‡] f^fu,Â□A[•ñ□□] ,ðfNfŠfbfN,μ,Û,·□B[□áŠQ•ñ□□,ì□î•ñ] f_fCfAf□fO f{fbfNfX,ª•\Ž!,ª,è,Û,·□B•K-v,È,·,×,Ä,ìff□[f^,ð"ü-Í,μ□l,!,½,ç□A['-□M] ,ðfNfŠfbfN,μ,Û,·□B^êŽžffBfCEfNfgfŠ (,½,Æ,!,ì□AC:\Windows\Temp) ,É Dxinfo.txt ,Æ,ç,±-¼'O,ìfefLfXfg ftf@fCf<,ª□ì□-,ª,è□Af□f,' ,ÁŠJ,©,è,Û,·□B,±,ìftf@fCf<,É,Í□A'O,ì•û-@,ÂŽú□W,ª,è,½□î•ñ,ì,Û,©,É□Af_fCfAf□fO f{fbfNfX,Â"ü-Í,μ,½CEÄ□ì□î•ñ,â,»!,¼,ì□î•ñ,ªšÛ,Û,è,Û,·□B

-â'è,ð•ñ□□,·,é

DirectX ,lfRf“f□□lf“fg,Ü,½,ífhf%ofCfo,ÉŠÖCEW,ª, ,é,ÆŽv,í,è,é-â'è,ª”□¶,µ,½□ê□#,í□Af}fCfNf□\ftfg
fefNfjffj< ftf□□fg,É~A—□,·,é,±,Æ,ª,Ä,«,Ü,·□BfefNfjffj< ftf□□fg,Ö,ì~A—□,ì•ù-@,É,Ä,ç,Ä,í□AMicrosoft®
Windows® fwf<fv,ì□ufgf%ofuf<fvf...□[fefBf“fO□v,ðŽQ□Æ,µ,Ä,,¾,¾,ç□BŠJ”-
ŽÖCEü,~fŠfŠ□□fX,ì□f'ffc□□f<,ðŽg,Ä,Ä,ç,é\ftfgfEfffAŠJ”ŽÖ,Ä, ,é,í□A“dŽqf□□f<,Ä-â'è,ð•ñ□□,·,é,±,
,Æ,à,Ä,«,Ü,·□B

'□ : Žÿ,ìŽè□#,í□A,±,íf□□f<,ìŠJ”ŽÖCEü,~fŠfŠ□□fX,É,ì,Ý“K—p,¾,è,Ü,·□B,±,ì•ù-
@,í□A,·,x,Ä,ìft□□fU□□,ªŽg,ì,é,í,~,Ä,í, ,è,Ü,¹,ñ□B

► “dŽqf□□f<,Ä-â'è,ð•ñ□□,·,é,É,í

1. [,>,è,Ä,à-â'è,ª%ðCE^,µ,È,ç□ê□#, f^fu ,Å□A[•ñ□□] ,ðfNfŠfbfN,µ,Ü,·□B
2. [□áŠQ•ñ□□,ì□î•ñ] f_fCfAf□fO f{fbfNfX,É•K—v,È,·,x,Ä,ì□î•ñ,ð“ü—í,µ□A[‘—□M] ,ðfNfŠfbfN,µ,Ü,·□B
3. □ì□-,¾,è,½fefLfXfg ftf@fCf<,ìftf< fpfX,Æ“dŽqf□□f< fAfhfCEfX,ðŽì,·f□fbfZ□□fW,ª•\Žì,¾,è,Ü,·□B“dŽqf□□f<
fAfhfCEfX,ð□',«,Ä,~,Ä,~,«,Ü,·□B[OK] ,ðfNfŠfbfN,µ,Ü,·□Bf□f,' ,ª<N“®,¾,è□ADxinfo.txt ,ì“à—e,ª•\
Žì,¾,è,Ü,·□B
4. f□f,' ,ì [•Ò□W] f□fjf...□[ì [,·,x,Ä'í'ð] ,ðfNfŠfbfN,µ□A[•Ò□W] f□fjf...□[ì [fRfs□□]
,ðfNfŠfbfN,µ,Ü,·□Bftf@fCf<,ì,·,x,Ä,ì“à—e,ªfNfŠfbfvf{□□fh,É“ü,è,ç,è,Ü,·□B
5. “dŽqf□□f< fvf□fOf%of€ ,Å□V,µ,çf□fbfZ□□fW,ð□ì□-,µ□AfNfŠfbfvf{□□fh,ì“à—e,ðf□fbfZ□□fW-{•¶,É“\
,è•t,~,Ü,·□B,±,ìf□fbfZ□□fW,ð□AZè□# 3 ,Å□',«,Ä,~,½fAfhfCEfX,É'—□M,µ,Ü,·□B

