

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 Ÿ □ ð] , ð f N f Š f b f N , μ , Ä , , ¾ , ³ , ç □ B

DirectX

Microsoft® DirectX®

DirectX

-à'è.ìĈ^ö,đ"Á'è,.é

DirectX fRf"fi"flf"fg.ìfefXfg.đs,æ

Šù'è,ì"®ì,đ•ïX,.é

fhf%ofCfo,đ•œĈ³,.é

î•ñ,đ•Ů'ŋ,.é

-à'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 designed to be a unified API for all Windows operating systems, including Windows 7, Windows 8, and Windows 8.1. It is also designed to be a unified API for all Windows hardware, including desktop PCs, laptops, and tablets. DirectX 11.1 is a significant update to the DirectX 11 API, adding new features and improving performance. The new features include support for 16-bit floating point numbers, support for 32-bit integers, and support for 64-bit integers. The performance improvements include support for multi-threaded rendering, support for multi-view rendering, and support for multi-pass rendering. DirectX 11.1 is a key component of the Windows operating system, and it is essential for many applications, including games and professional graphics software.

-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'â•□,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,ðŽ,·f}□[fN,ª\ Ž,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,»,"¼,ì-â'è,ªŽ,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^ê•", 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•\Ž,³,è,Ä,ç,È,ç,©Šm"F,μ,Ä,,¾,³,ç□B•\Ž,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,»,"fffofCfX,ª□ADirectX □f'ffc□[f<, ì ["ü—í] f^fu,É•\Ž,³,è,Ä,ç ,é,©,ç,α,©Šm"F,μ,Ä,,¾,³,ç□B•\Ž,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□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[]AfAvfŠfP[]fVf‡", ©,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,È,è,Ü,·[]B

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

▶ **fŠftfCEfbfVf... fCE[]fg,ì•ïX,ðžæ,è[]Á,µ,Ä[]ADirectDraw fAfVfŠfP[]fVf‡",ª"ÆZ©,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] ,ðfj^",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%ođCE^,É,Í□A,±,é,ª□Ä,à,æ,¢•û-@,Ä, ,é□ê□‡,ª, ,è,Ü ,·□B

[,»,é,Á,à-â'è,ª%ođCE^,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,·,é 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

ŕî•ň,đ•Ů'ŕ,·,é

DirectX ŕf'ffcŕ[f<,žúŕW,μ,½ŕî•ň,đ•Ů'ŕ,·,é,É,ÍŕA2 ,Á,ì•ú-@,ª, ,è,Ů,·ŕB

ŕ [ŕî•ň,đ,·,×,Ä•Ů'ŕ] ,đfNfŠfbfN,μ,Ů,·ŕB,·,×,Ä,ìfyŕ[fW,ìŕî•ň,ªŕAZw'è,μ,½ŕêŕŠ,É, ,éŽw'è,μ,½-¼'O,ìftf@fCf<,É•Ů'ŕ,ª,è,Ů,·ŕB

,±,ìfcŕ[f<,ìŠJ"ŽÒEü,~fšfšŕ[fX,đŽg,Á,Ä,ç,éftfgfEfFfAšJ"ŽÒ,Á, ,é,ÍŕAZÿ,ì•ú-@,đ,Æ,é,±,Æ,à,Á,«,Ů,·ŕB

ŕ [,»è,Á,à-â'è,ª%øđCE^,μ,È,çŕêŕ‡] f^fu,ÁŕA[•ňŕŕ] ,đfNfŠfbfN,μ,Ů,·ŕB[ŕáŠQ•ňŕŕ,ìŕî•ň] f_fCfAfŕfO f{fbfNfX,ª•\Ž!,ª,è,Ů,·ŕB•K-v,È,·,×,Ä,ìffŕ[f^,đ"ü-Í,μŕl,!,½,çŕA['-ŕM] ,đfNfŠfbfN,μ,Ů,·ŕB^êŽžffBfCEfNfgfŠ (,½,Æ,!,ìŕAC:\Windows\Temp) ,É Dxinfo.txt ,Æ,ç,ª-¼'O,ìfefLfXfg ftf@fCf<,ªŕŕŕ-ª,èŕAfŕf,' ,ÁŠJ,©,è,Ů,·ŕB,±,ìftf@fCf<,É,ÍŕA'O,ì•ú-@,ÁŽúŕW,ª,è,½ŕî•ň,ì,Ů,©,ÉŕAf_fCfAfŕfO f{fbfNfX,Á"ü-Í,μ,½CEÁŕŕŕî•ň,â,»!,¼,ìŕî•ň,ªšŮ,Ů,è,Ů,·ŕB

-â'è,ð•ñ□□,·,é

DirectX ,ìfRf“f[]f[]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•û-@,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,±,ìfc□[f<,ìŠj”ŽÖCEü,~fŠfŠ□[fX,É,ì,Ý“K—p,¾,è,Ü,·□B,±,ì•û-
@,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 ,Ä□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€ ,Ä□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 ,Ä□',«,Ä,~,½fAfhfCEfX,É'—□M,µ,Ü,·□B

